PRE - CLINICAL STUDY OF SIDDHA DRUG

RAJAKESARI CHOORANAM

FOR ITS BRONCHODILATOR, ANTI-SPASMODIC,ANTI-HISTAMINIC, AND ANTI-INFLAMMATORY ACTIVITIES

Dissertation submitted to

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BRANCH-II-GUNAPADAM

POST GRADUATE DEPARTMENT OF GUNAPADAM

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TIRUNELVELI-627002

OCTOBER 2016

GOVT. SIDDHA MEDICAL COLLEGE, PALAYAMKOTTAI

DECLARATION BY THE CANDIDATE

I hereby declare that this dissertation entitled "**Pre clinical study** of siddha drug ***Rajakesari chooranam*** for it's Bronchodilator,anti-spasmodic,anti-histaminic and anti-inflammatory properties" is a bonafide and genuine research work carried out by me under the guidance of **Dr.A.KINGSLY**,**M.D(s).,** Reader, Post Graduate Department of Gunapadam, Govt.Siddha Medical College, Palayamkottai, and the dissertation has not formed the basis for the award of any Degree, Diploma, Fellowship or other similar title.

Date: Signature of the Candidate

Place: Palayamkottai Dr.P.Nithiya

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CERTIFICATE BY THE GUIDE

This is to certify that the dissertation entitled "**Pre clinical study** of siddha drug ***Rajakesari chooranam*** for it's Bronchodilator,anti-spasmodic,anti-histaminic and anti-inflammatory properties" is submitted to the Tamilnadu Dr.M.G.R. Medical University,Chennai-32, in partial fulfillment of the requirements for the award of degree of M.D (Siddha) is the bonafide and genuine research work done by **Dr.P.Nithiya** under my supervision and guidance and the dissertation has not formed the basis for the award of any Degree, Diploma, Associateship, Fellowship or other similar title

Date: Seal and Signature of the guide

Place: Palayamkottai

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BONAFIDE CERTIFICATE

This is to certify that the dissertation entitled "**Pre clinical study** of siddha drug ***Rajakesari chooranam*** for its Bronchodilator, anti-spasmodic, anti-histaminic and anti-inflammatory properties" is a bonafide work done by **Dr.P.Nithiya,** a candidate of GSMC, palayamkottai.in partial fulfillment of the University rules and regulations foraward of MD (Siddha)-Gunapadam under my guidance and supervision during the academic year of 2016

Name & Signature of the Guide&

Head of Department

Name & Signature of the Principal

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ABBREVATIONS

RC	-	Rajakesari *chooranam*
ALT	-	Alanine transaminase
ANOVA-	-	Analysis of variance
AST	-	Aspartate transaminase
CMC	-	Carboxyl Methyl Cellulose
CDC	-	Council of Disease control and prevention
CPCSEA	-	Committee for the purpose of control and supe
DC	-	Differential Count
EDTA	-	Ethylene Diamine Tetra Aceticacid
ESR	-	Erythrocyte Sedimentation Rate
FTIR	-	Fourier transform infrared spectroscopy
Hb	-	Haemoglobin
IAEC	-	Institutional Animal Ethical Committee.
ICP-OES	-	Inductively coupled plasma optical emission spectrometry
Ig E	-	Immunoglobulin E
LDH	-	Lactate Dehydrogenase
MCV	-	Mean Corpuscular Volume
OECD	-	Organisation for Economic Co-operation and Development

PCV	-	Packed Cell Volume.
PGE	-	Prostaglandin E
RBC	-	Red Blood Corpuscles
SEM	-	Scanning electron microscope
TLC	-	Thin Layer Chromatography
HPTLC	-	High performance thin layer chromatography.

CONTENTS

1.INTRODUCTION:

Siddha medicine is of (some) 2500 years ago, Siddha means *Siddhi*, which means achievement in life arts such philosophy ,yoga,wisdom,alchemy,medicine and above all the art of longevity.The concept of siddha based on 96 principles which is the base of human life.

The persons who attained this siddhi are respectively called as siddhars who are also can be called as spiritual scientists.

In old days siddha system received petronage of Tamil Kings and general public all through.Yes it's true it's our medicine that is suitable for our climate,culture and so on.

"kWggJ clyNeha kUenjd yhFk
kWggJ csNeha kUenjdrrhYk
kWggJ ,d‰Neha thuj‰Uff
KWggJ rhit kUenjdyhNk"

-j‰U%yh

According to the above lines by Thirumoolar he states that medicine is,

- That which cures the health problems
- That which cures the psychic problems
- Not only enriching physical and mental health and preventation of disease.
- Medicine is that mankind from death.Paving way to holistic health.

The statement of Thirumoolar gives a clear and brief knowledge about what is Siddha system.

The ancient Dravidian's science is applicable to the Mordern world also.This is evidence from WHO's aims about holistic health.

In siddha system, SWASAM can be correlated with bronchial asthma.Despite the availability of wide range of drugs,the relief offered by them is symptomatic and shorts lives, more over these drugs produce side effects.Therefore,there is a desire need to identify effective and safe remedies to treat bronchial asthma.Herbal, medicines are being used by nearly about 80% of world populations.Primarily in Developing countries for primary health care.The herbo mineral drugs described inSiddha system have been, the basis of treatment of varies human disease. Selectionof scientific and systematic approach

for the biological evaluation of herbal drug Formulations, based on their view in the traditional systems of medicine forms the Basis for an ideal approach in the development of new drug from herbs.

Among several respiratory disease of man, Bronchial asthma is the most Common disabling syndrome.

Bronchial asthma is the most common allergic disease of human beingl leading to more complications.Bronchial asthma is an inflammatory disorders of the airways characterized by varies airway obstruction,airway inflammation and bronchial hyper responsiveness and is a global health problem that results from a complex interplay between genetic and environmental factors.Nearly 7-10% (300million) of the world population suffers from Bronchial asthma.

As of 2011.235-300 million people world wide are affected by asthma andapproximately 250,0 people die per year from the disease.Rates very between countries with prevalence between 1 and 18%.It is more common in developed than developing countries.One thus seen lower rates in Asia,Eastern Europe and Africa with in developed countries it is more common in those who are economically disadvantaged while in contrast in developing countries it is more common in the affluent. The reason for the differences is not well known,low and middle income countries make up more than 80% of the mortality .While asthma is twice as common in boys as girls severe asthma occurs at equal rates.In contrast adult women have a higher rate of asthma than me and it is more common in the young than the old.

Global rates of asthma have increased significantly between the 1960,and 2008 with it being recognized as a major public health problem since the 1970s.Rates of asthma have plate in the developed world since the mid 1990s with recent increases primarily in the developing world.Asthma affects approximately 7% of the population of the United States and 5% of people in the United Kingdom Canada, Australia and New zeland have rates of about 14-5%.

Mortality however is most common in low to middle income countries while symptoms were most prevelent (as much as 20%) in the united Kingdom, Austrelia, Newzealand, and Republic of Ireland, they were lowest (as low as 2-3%) in Eastern Europe, Indonesia,Greece,India. Here, I have taken there is a preparation called "*Rajakesari chooranam*" for its easy availability of drugs.Which is exclusively indicated for *Eraippu Noi*. **(Bronchial asthma).**

2. AIM AND OBJECTIVES

According to the CDC (Council of Disease prevention and Control), more than 300 million peoples suffer with asthma today. Today number of synthetic bronchodilator, anti-spasmodic, anti-histaminic, anti-inflammatory drugs are available for symptomatic control of bronchial asthma. This synthetic drug may cause side effects. Therefore the modern world is searching for suitable traditional remedies because of without any adverse effect. In order to achieve this aim an attempt was made to establish the scientific validity for bronchodilator, anti-inflammatory, anti-histaminic, & anti-spasmodic property **of *RAJAKESARI CHOORANAM.***

OBJECTIVES:

The main objective of the present study is to high light the safety and efficacy of ***RAJAKESARI CHOORANAM***on ***ERAIPPU NOI***, the following methodology was adopted to evaluate the drugs and its standardization studies.

- To collect the literature evidence regarding the trial medicine Identification of the drugs in the *RAJAKESARI CHOORANAM*...
- To prepare the trial medicine as per the text
- Physico-chemical analysis of Test drug
- Evaluation of the toxicity of Test drug
- Evaluation of Broncho dilator activity of test drug on Broncho-alveolar levage in mice.
- Evaluation of Anti-spasmodic activity of test drug on Excised Rat Ileum.
- Evaluation of Anti histaminic activity of test drug on Inbred Wister rat& guinea pigs.
- Evaluation of anti-inflammatory activity of test drug on Albino rats.

3. REVIEW OF LITERATURE

3.1. thy k‰s F

PIPER CUBEBA. Linn…

3.1.1. GUNAPADAM ASPECT

Other Names:

‘mUs‰Ndhk Nuz‰f nkdWk NgU
mjJuhj‰ tll nkdw‰jwFg NgU
mUs‰Ndhk myqfhH nkdWk NgU
mNrhh‰j nkdw‰jwFg NgU z lhrR
kUs‰Nd thk J}yhj‰ vdWk NgU
kfjjhd jfNfhy nkdw‰jwFg NgU
rUs‰Ndhk rJllNk nkdw‰jwFg NgU
Rkj jhfr nrhyy‰t‰lNlhk thyk‰sf‰d NgNu”

- ***Panja kaviya Nigandu.***

- *Asoritham*
- *Thulathi*
- *Thakkolam*
- *Sathuttam*

HABITAT:-

1. This climbing woody bush is indigenous to Java Sumatra &Malay Archipelago; but the dried full grown fruits of the shrub called cubebs.
2. It also cultivated to a small extent in India especially in the Mysore state.

Parts used	-	Dried immature full grown fruits called cubebs
Colour	-	Greyish brown to black.
Odour	-	Aromatic
Taste	-	Pungent
Character	-	Veppam
Bio transformation	-	Pungent

ACTION:-

- Stimulant
- Carminative

- Diuretic
- Expectorant

General Characters: (Pothu gunam)

‘ thjgpjj lak tapwW typ jhfQ
rjk gyNeha rpi jAqfhz -Nghj
mjpj gdkhk mz qfuNr ehSe
Jjpthy kpsfUejr nrhy

It cures *vatha, pitha, kabha* disease, ulcer, thirst. It increases appetide.

- **Pathaartha Guna Sinthamani**

THERAPEUTIC USES:-

- ❖ Small dose of cubeb improve digestion and increase the appetite.
- ❖ Cubeb is said to increase the force and frequency of the heart. It is eliminated by the kidney, lungs and skin.
- ❖ Dried cubebs internally for oral and dental disease, loss of voice, halitosis, fever and cough.
- ❖ The paste of the cubeb berries externally on male and female genitals to intensify sexual pleasure during coitus.

VAALMILAGU CONTAINING BRONCHIAL ASTHMA MEDICINES

I.CHOORANAM:-

1. **Thalisapathri Chooranam**

   Dose - *Thirukadi*

   Indication - Bronchial asthma, Hiccough, Thirst.

2. **Kandankathiri Chooranam**

   Adjuvant - Ghee

   Indication - Bronchial asthma, cough, tuberculosis

II. YENNAI:-

3. **Korasanai Yennai:**

   Dose - *Thuttalavu*

   Adjuvant - Aloe vera juice

   Indication - Bronchial asthma, Cough.

III. MAATHIRAI:-

4. Kungumapoo Mathirai

Dose - *Payaralavu*

Adjuvant - Honey

Indication - Bronchial asthma, Cough Fever

thy k|sF

PIPER CUBEBA.Linn…

3.1.2.BOTANICAL ASPECT

Taxonomic Classification:

Kingdom	-	Plant kingdom
Division	-	Spermatophyta
Sub division	-	Angiospermae
Class	-	Dicotyledonae
Subclass	-	Monochlamydeae
Series	-	Microembryeae
Family	-	Piperaceae
Genus	-	Piper
Species	-	P.Cubeba

Vernacular Names:

English	-	cubebs, tailed pepper
Hindi	-	Kababcin
Mah	-	Kankola
Malayalam	-	Valmulaku
Sanskrit	-	Kankolam
Tamil	-	Vaalmilagu
Telugu	-	Calavamiriyalu
Arab	:	Kababh

Distribution:-

Native of Indonesia, cultivated in Karnataka, yet large amount of fruit is imported. In India it is experimentally cultivated. Cultivated in java, Sumatra Ceylon and West Indies.

Description:-

A perennial woody climber with ash grey climbing stems and branches, rooted at the joints, leaves simple, ovate – oblong, smooth, base, flowers small fruits subglobose berries.

Parts used: -Dried unripe berries

Phytochemical aspect:

- ❖ Hignokenin
- ❖ Dusin
- ❖ Dihydrocubebin

Oxygenated cyclohexanes:

- ❖ Piperinol A
- ❖ Piperinol B

The most characteristic constituent of cubeb is the essential oil (oil of cubeb) the proportion of which varies from 5 – 20%. In addition the fruits contain resinous matter, fixed oil, starch and nitrogenous substances. The resinous matter is made up of several acidic and neutral substances of undetermined composition including cubebin having a bitter taste.

The therapeutic value of the drug is said to be largely due to cubebic acid.

Other Terpene Alcohols:

- Sesquiterpenes mainly 1 – cadinene
- Sesquiterpene alcohols

Early investigation on chemical composition shows the presence of dipenten, 1 – terpene, 1 – cadinene azulence and so called cubeb camphor a sesquiterpene alcohol

Properties and uses:

- ❖ The berries are acrid, bitter, thermogenic, aromatic, stimulant, anodyne, anti – inflammatory, anthelmintic, digestive, carminative, sedative, expectorant, rejuvenating, and diuretic.
- ❖ They are useful in somatalgia, odontalgia, cephalalgia, halitosis, inflammation, wounds, ulcers, catarrh, anorexia, dyspepsia, flatulence, haemorrhoids.
- ❖ It cures cough, asthma, bronchitis, amenorrhoea, dysmenorrhoea, cystitis, genito – urinary diseases like gonorrhoea & rheumatism.
- ❖ The cubeb powder mix with rosewater to use externally for headache. 260mg of cubeb powder mix with milk to drink it cures throat infection.

3.1.3.LATERAL RESEARCH:

Phytochemical Evaluation and Antioxidant activity of Piper cubeba. Gayatri Nahak and R.K. Sahu

ABSTRACT:

Recent scientific research has established the presence of many active compounds in these spices that are known to possess specific pharmacological properties. Among the plants investigated to date, one showing enormous potential is the Piperaceae. Piperine is an alkaloid found naturally in plants belonging to the pyridine group of Piperaceae family, such as Piper cubeba. It is widely used in various herbal cough syrups and it is also used in anti inflammatory, anti malarial, anti leukemia treatment. So the present study was aimed to extract the phytochemical compounds in different solvent system in Piper cubeba.

3.2. rhjpffha

MYRISTICA FRAGRANS. Houtt...

3.2.1. GUNAPADAM ASPECT

Other names:

rhjpffha NgHji dNa rhjjf Nfs
rhjpgyQ rhjprrpaKkhFk
khjpffha fhYukh kjpgykh
kjrTz lQ rhjpfKkhFq
fLffha fggpypdpw Jwqrpahfq
fLffhapd yfphpjhd gyto pfpahfQ
#jpffha jpwffpd gpjjdh rdpahfQ
nrggpaNjhH rhjpffha nraYkhNk.

- Pogar Nigandu 1200

Saathichiyam, Saalooram, Athibalam, Saathigam, Kappilinira durachi, Lagithirakkani, Pithanaasini

‘eyy thjp kynkdWk› ryffhnadWk
eyykhd thjpNuhja nkdWk NgU
nrhyyfNfs rptrpfpj nkdWk NgU z lhrR
rhpl nkdwpjwFg NgH nrggpNdhk ehk
nrhyy rpj nkdwpjwFg NgU
RNj tdhjp jnkdwpjwF NgU
myytqfhu nkdwpjwFg NgU
mUspNdhk› rhjpffhajwFk NgNu.

- Panja Kaaviya Nigandu.

Nallavaathi malam, Seelikkai, Vaathirothaiyam, Sivasikitham

- **Part used** - Fruit and aril
- **Taste** - Astringent,Pungent
- **Character** - Veppam
- **Biotransformation** - Pungent

Action:-

- Stimulant
- Tonic
- Carminative
- Aphrodisiac

General Characters: (Pothu gunam)

"jhJ ellk Ngj rUthr lgQr uNeha
XJ th rqfhrk clf uz - NtNjh
Vyffha t Ukg z Nghk Vwwikahy gjjq
Fyffh kUj J thfF $W"

-Pathartha Gunapadam

Jathikai cures oligospermia, Diaharrhoea, wheezing, cough, dysentry, then it cures abdominal pain, abdominal distension and indigestion

Therapeutic Uses:

Useful in conditions of *kapha and vata*; inflammations, cephalalgia, helminthiasis, halitosis, dyspepsia, flatulence, colic, asthma, catarrh, Diarrhoea, vomiting, Amenorrhoea, dysmenorrhoea, ulcer, hepatopathy, spleenopathy, impotency, skin disease and general debility.

SAATHIKKAI CONTAINING BRONCHIAL ASTHMA MEDICINE

I. CHOORANAM:-

1. Thiratchathi Chooranam

- Dosage : *1 Kaasadai*
- Indications : Cough, *Pitham, Kaasam.*

2. Karpoorathi Chooranam

- Adjuvant : Sugar or honey
- Indications : *sayam*, ulcer

II. YENNAI:-

3. Saathikai Yennai

- Dosage : 1 drop
- Adjuvant : Mother milk or water
- Indications : Cough, *Kabam*, vomit

III. MAATHIRAI:-

4. Kaasakudaaram

- Dosage : 1 Pill
- Adjuvant : water
- Indications : Bronchial asthma, dysentery.

IV CHENDURAM:-

5. Poorana Chandrothaiya Chenduram

- Indications : Bronchial asthma.

V. KIRUTHAM:-

6. Thoothulaiyaathi Kirutham

- Dosage : 2 thuttu edai
- Indications : Cough, asthma

rhjpffha

MYRISTICA FRAGRANS. Houtt...

3.2.2.BOTANICAL ASPECT

Taxonomic classification

Kingdom	-	Plantae
Order	-	Magnoliales
Family	-	Myristicaceae
Genus	-	Myristica
Species	-	Fragrans

Vernacular Names:

Eng	-	Nutmeg tree, Mace tree
Hindi	-	Jayphal
Kan	-	Jajikayi
Mal	-	Jati, Jatikkamaram
Sans	-	Jati, Jatiphalah
Tam	-	Jatimaram, Jatikkai
Telu	-	Jajikaya
Burm	-	Zadu – phu
French	-	Musque

Distribution:

Native of Malaya, Molukkas. It also cultivated in Srilanka.Cultivated in the hotter parts of India upto 750 with 150 – 300 cm per annum.

Habit:

A moderate sized aromatic, evergreen greyish black bark having lenticular spots on the outside and red in the inner side, leaves elliptic, flowers creamy yellow fruits yellow, pesicarp fleshy, testa shiny, aril yellowish red; irregularly lobed.

Past used: Fruit and aril

FRUITS:

- Fruits are brown or greyish brown and reticulately furrowed.
- A patch of lighter colour with brown lines surrounded by a ring is seen at one end of the fruit from this is a furrow runs to the chalaza at the opposite end of the kemal where there is a small depression.

- In longtitudinal section a marble like lusterom appearance is given. The dark brown perisperm forming the outer tissue penetrates the light brown endosperm. Fibrovascular bundles are also seen in the perisperm.
- The dried arillus is of bright red or corol colour section shows thick walled epidermis and large amount of parenchyma in which fibrovascular bundles and large oil cells are seen.

According to zandes, there are four grades of East Indlain nutmegs.

1. The banda nutmegs.
2. The siauw nutmegs.
3. The Penang nutmegs.
4. The papua nutmegs.

PHYSIO – CHEMICAL PROPERTIES OF OIL OF NUTMEG

Oil of nutmeg is a mobile, almost colourless or pale yellow liquid, possesing an odour and flavour characteristic of spice, especially a dilution. With the passage of time the oil takes up oxygen and partly resinifies, becoming more viscous.

CHEMICAL COMPOSITION OF NUTMEG AND MACE OIL

The presence of the following compounds

1. Camphene
2. β – pinene
3. Dipentene
4. P – cymene
5. d – Linacool
6. Borneol

MYRISTIC ACID:-

M.P.54^0c present in the oil free and esterified. Depending upon the length of distillation and the steam pressure applied, smaller or larger amount of this acid and its esters occur in the oil. On evaporation of the oil, the acid remains in the residue. It large quantities are present the acid may separate from the oil in crystalline form. In the early

literature, this crystalline deposit was called myristicin. It must not be confussed with true myristicin.

USES OF NUTMEG AND MACE OILS:

It used widely for the flavouring of numerous food products, particularly baked goods cakes, cookies, custards, pudding, pickles etc.

Salway found, oils of nutmeg and mace are somewhat poisonous, the toxicity being caused presence of myristicin. In pharmaceutical preparations the oil has been recommended for treatment of inflammation of the bladder & urinary tract large doses must be avoided.

ACTION AND USES:

- Anodyne, aphrodisiac, appetizer, astringent, carminative, narcotic, stimulant and stomachic.
- Used in Anorexia, diarrhoea, dysentery, flatulence, headache, impotence, nausea, respiratory disorder, rheumatism, urinogenital disorders and vomiting.
- Traditionally used extensively for diarrhoea of infants and pigmental disorders of the face. Ethnologically considered as on important item of toiletery.

3.2.3. LATERAL RESEARCH:

Journal of Pharmacognosy and pytochemicals histological and histo chemical

Investigation of Myristica Fragrans. Houtt

(www.phytojournal.com)

Myristica fragrans Houtt. Is an evergreen tree, native of the E. Moluccas and Cultivated throughout Malaya. It is found only as a specimen tree in Botanical Gardens. The seed of the plant is known as “nutmeg” and the arillus of the seed is Called “mace”. Both nutmeg and mace contain many volatile oils. These oil Constituents have a variety of individual pharmacological effects, some of which Oppose others (Jellin et al; 2005). The fruit contains ethereal oil-cells often with Phenolic and myristicin; the seed and the aril are used for flavouring food. Of the 72 Species of Myristica of global level distribution, five species are reported in S. India (Gamble, 1921). M. dactyloides Gaert. Is reported in the W.Ghats of Tamil Nadu (Mathew, 1999; Henry et al; 1987). The S. Indian species of Myristica are identified On the basis of inflorescence, leaf - venation, fruit

shape and colour of the aril. The Main objective of the present study is to propose protocol of anatomical profile and Histochemical localisation of the ragrant compounds in the fruit including seed and Aril. Fragmentary account of the anatomical studies are available in the Pharmacognosy books (Wallis, 1985; Trease and Evans, 1978; Claus, 1956; Kolammal, 1979) which give a superficial description of the fruit of Myristica. In the Present investigation it is proposed to provide detailed cellular organization and Histochemical aspect of the pericarp, seed and aril of the fruit.

3.3. Nguujij

ALPINIA GALANGA, Wild.

3.3.1. GUNAPADAM ASPECT

Other names:

‘mujijaÇl ngaHjidNa miwafNfS
MzikahkuhrÇdthkrhrÇahFkl
cujijahkcjjuthkrÇNtqfÇahFk
czikahkhrhkehirtajjhkhFk
jÇhÇNjh\ thjfhrhffÇdÇahFk
fueijahqfgTjhehrdÇkhFk
fzLiujjngnuyyhkujijffhNk”

- Pogar Nigandu 1200

‘Nfh\lnkdwnfejrhkjhnddWkNgU
nfhzLnfejeduzÇnadWkNgU
MllnkdwrÇjfkgQRujhfFjk
mlthkrnrUffkggtdnkdWkNgU
ehllnkdwjjjgnkdWk,jwFNgU
ehjehjhejnkdWk,jwFNgU
GfohfrnrhyyÇtÇlNlhkNguujijaÇdNgNu”

- Agasthiyar Yemathathuvam Ennum Panjakaviya Nigandu

‘Jkguh\lfk”-Saambasivampillai Mooligai Agarathy (220)

- **Habit** : The plant is 6 – 7 height, bears the perennial rhizome.
- **Habitat** : South India & Bengal
- **Parts used** : Rhizome
- **Taste** : Pungent
- **Character** : Veppam
- **Bio transformation** : Pungent
- **Actions** : Expectorant
  Febrifuge
  Stomachic

GENERAL CHARACTERS:

"njhz ilaW flLq fgj ijj J}uj Jujjtplk
gz ilrrjjijg gwffbfFk- nfz ilt/o
k/dNd fuggid Ntwhf Fk gr/nfhLf Fk
nrhdNdhk aujijr Rfk"

- Pathaartha Gunapadam

It cures cough, Asthma, Eczema, chest pain, oedema, tooth disorder, *Nenju kozhai, and vathasuronitham.*

" mujij fgjij aWfFqfhy XlLQ
r/ujj/y cWk<isarr/ijfFk- ,iujJt/Lk
g/jjNjh \jijg g/wty/gig khww/t/Lk
cwwrHt tyy/\kNghfFk.

- Pathaartha Gunapadam

It cures Asthma, *Kabam, pitha thosham, sarvavisham, vata kaeduppu*, pain.

Therapeutic uses:-

- For the treatment of skin disease in powder (dose: 5 to 10 grains) or Tincture (1 in 10); dose: ½ to 1 drachm paste made with any brand oil to apply locally in skin disease.
- The rhizomes are useful in rheumatism and catarrhal affections.
- Tubers and seeds are used as a fragrant adjunct to complex prescriptions.
- It is a good remedy for impotence and nervous debility & respiratory ailments
- The paste of Galanga in honey lessened the paroxysms of cough in children suffering from whooping cough.
- The antispasmodic action of the drug may also prove useful in condition like asthma.

It is useful for intestinal & biliary colic, diabetes mellitus, dyspepsia, fever, incontinence and destroy smell in mouth &other parts of the body & used to improve the voice in throat infection.

PERARATHAI CONTAINING BRONCHIAL ASTHMA MEDICINES

I. NEI:-

1. Thoothuvalai Nei

- Indication - Bronchial asthma, Tuberculosis.

II. RASAYANAM:-

2. Thippili Rasayanam

- Indication - Bronchial asthma, Cough, Tuberculosis.

III. LEGIUM:-

3. Sarapangavilvathi legium

- Dose - *1 ¼ Varaganedai*.
- Indication - Sayam, ulcer, dysentery.

OTHER MEDICINE

1. Panjamoola Chooranam.
2. Amukkara Chooranam.
3. Karunkozhi Chooranam.
4. Narasimma legium.
5. Nilappanai Kirutham.
6. Nanthi Nei
7. Yeranda Thailam.

Nguhjij

ALPINIA GALANGA, Wild.

3.3.2. BOTANICAL ASPECT

Taxanomic Classification:

Kingdom	-	Plantae
Order	-	Zingiberales
Family	-	Zingiberaceae
Subfamily	-	Alpinioideae
Genus	-	Alpinia
Species	-	Galanga

Vernacular Names:

Tamil	-	Perarathai
Sans	-	Dhumbarastma
Hindi	-	Barakalinjan
Marathi	-	Koshtkulinjan
Malayalam	-	Peraratha
Gujarat	-	kolinjan
Portuguese	-	Galanga
Telugu	-	rash – trakam
English	-	Greater galangal

HABITAT:

- Distributed throughout the topics, Java, Sumatra, South India, and Bengal.
- Widely distributed mainly in the Eastern Himalayas and South West India.

Parts used: Rhizome

Actions:

Aromatic, Stimulant, Bitter, Stomachic, Carminative.

Distribution: Throughout the Western Ghats are curtivated

RHIZOME:

- The rhizomes are cylindrical, irrequlary branched and often bent like knee size 5 - 10cm long upto 20 cm.
- Brownish red externally pale brown internal surface marked with five annuli of lighter colour than the general surface.
- Aromatic odour

Taste: Characteristic spicy, aromatic, pungent.

DESCRIPTION

The leaves are 23 – 45 by 3.8 – 11.5 cm long. Simple arranged distichously and having sheathing leaf bases and ligules, lanceolate with a strong mid rib and numerous ascending parallel veins

Types of galangal Rhizome:

- ❖ Alpinia calcarata – Rose Substitute for Alpinia galangal cultivated in Honghong.
- ❖ Alpinia officinarum Hance (or) lesser galangal Native of China.

CONSTITUENTS:-

- ❖ According to chemist Jahus, galanga root contains these three different compounds campheride, galangin and alpinin. From the green rhizomes, a pale yellow volatile essential oil with a pleasant odour can be obtained on distillation. The oil contains 48% of methyl cinnamate, 20 to 30% of cincole; camphor and probably d – pinene.

Phytochemistry:-

Isolation of 1 – acetoxy chavicol acetate, 1 – acetoxy eugenol acetate and 1 – hydroxy chavicol acetate, new diterpenes, galangal A and galangal B and characterised isolation of new compound di – (p – hydroxyl – cis – stryl), methane along with 17 – hydroxy cinnamol dehydrate from rhizomes.

Medicinal Uses:-

- Rhizome is used to treat asthma, diabetes mellitus, bronchitis, rheumatic arthritis, and nervine tonic.
- The tubers & seeds are said to possess carminative properties may be used in producing a reflex increase in the bronchial secretion.
- It improves appetide, taste, voice and used in head ache, chest pain, sore throat, burning sensation of liver, disease of kidney.
- The rhizomes are bitter, acid, thermogenic, aromatic,nervine tonic, stimulant, carminative, stomachic, disinfectant, aphrodisiac, expectorant, bronchodilator, febrifuge, anti – inflammatory and tonic.
- They are useful initiated conditions of vata & kapha, RA inflammation, Stomatopathy, cough, asthma, hiccough, dyspepsia and intermittent fever.

3.3.3. LATERAL RESEARCH:

Neuroprotective effect of Alpinia galanga (L.) fractions on Aβ (25–35) induced amnesia in mice.

J.C. Hanish Singha, V. Alagarsamyb, Prakash V. Diwana, S. Sathesh Kumarc, J.C. Nishad, Y. Narsimha Reddye.

AIM OF THE STUDY

This investigation is designed to screen cognitive improvement of Alpinia galanga (AG) fractions in Alzheimer's type of amnesia in mice induced by Aβ(25–35).

MATERIALS AND METHODS

Alzheimer's disease induced mice treated with fractions (n-hexane, chloroform and ethyl acetate) of AG in 200 and 400 mg/kg. Neurotoxicity was induced by intracerebroventricular injection of Aβ(25–35) on the 14th day of 21 days drug treatment. Open field and water maze were carried to determine habituation memory and hippocampal memory. Na+/K+-ATPase, acetylcholinesterase (AChE) and antioxidant enzymes (SOD, GPx, catalase and vitamin C) were determined in brain tissue homogenate to estimate the brain biochemical changes and its anti-amnesic potential with intensity of oxidative stress signaling. Further bioactive (chloroform) fraction was eluted through column chromatography to identify the lead molecules.

RESULTS

Increased habituation memory and decreased escape latency in behavioral parameter are the indicative of the cognitive enhancement after treatment with Alpinia galanga fractions. Increment in Na+/K+-ATPase and antioxidant activity depicts brain membrane integrity improvement and free radical scavenging property. AChE level was decreased to improve the cognition by enhancing cholinergic transmission.

3.4. j‰gg‰y‰

PIPER LONGUM. Linn...

1.4.1. GUNAPADAM ASPECT:

Other names:

‘j‰gg‰y‰a‰d NgHj i dNa nrggf Nf S
j l r z j z L y f khF … khF k
ggg‰y‰ghshf f‰ ahk rgykhF k
ngU j j rT z br‰akhKgF y y‰a khF k
tgg‰y‰ahk i t anj f f Nfhy dhkk
thj F d k j j‰h‰Njh\ ehr d‰AkhF k
fgg‰y‰ahq Nfhdbj i d aWf F ew # j d
fU j‰aNjhH j‰gg‰y‰a‰d ehkkhNk”.

- Pogar Nigandu 1200

Aarkathi, Unsaram, Uluvainaasi, Kaaman, Kudaari, Kolagam, Koli, Saram, Saadi, Ambu

‘t r d‰j j rykhd ry dhq nf dWk
t ykhd fh z ht j‰ na d Dk NgU
J r d‰j j Nj t dhj‰ na dWk NgU
J j‰ahd fh z ‰na dW k‰jwF g NgU
j r d‰j j n t y‰t hh‰ na dWk NgU
fU t hd N t fhej nk dw‰jwF g NgU
r d‰j j Nghj f nk dw‰jwF g NgU
t r d‰jNjhe j‰gg‰y‰f f‰ m j j g NgNu”

- Agasthiyar Panjakaaviya Nigandu

- **Parts Used** - Roots, Dried spikes.
- **Colour** - Brownish grey
- **Odour** - Aromatic
- **Taste** - Sweet
- **Character** - Veppam
- **Biotransformation**- Sweet

Actions:

- ❖ Stimulant
- ❖ Carminative

GENERAL CHARACTER :

“,Uky Fdkk ,iugG fagnz

<isghz Lreepahrk mNuhrfk

nghUky Cijrpuggpz p %Hriri rNeha

G+hpfFQ ry Njh\kgp yfKk

tUkUg ngUf NfhL kNfhjuk

thjk Mjp Kj Njh\e RuqFspH

ngUk iygGhp Nkfg gplfKk

NgUe jpggpypg Nguq Fiuff Nt”.

- Pathaartha guna sinthamani

It cures cough, ulcer, bronchial asthma, and Anemia, Headache, Fever, *vaatham*, Nose and ear disease.

‘MrdNeha njhz ilNeha Mtuz gpjjKjy

ehrptpop fhjpi tNeha ehlGONeha - trpUtp

aqfyhQr dQrpijAk mkgha mopteJk

nghqfyhQr eqifaH NfhlNghy”.

- Theraiyar Gunavagadam

It reduces cough, throat infections and it cures nose, eye, and ear diseases.

THERAPEUTIC USES OF PIPER LONGUM

- ❖ Thippili powder along with betal leaf juice and honey is used for expectoration, cough and fever.
- ❖ Thippili and Tran powder is used for menorrhagia and leucorrhoea.
- ❖ Thippili powder is mixed with honey to take one month for tinea versicular infection.
- ❖ Useful for gout, lumbago, dyspepsia, stomachalgia spleenopathy.

- ❖ It cures anorexia, epilepsy, fever, gonorrhoea, hiccough, asthma, bronchitis, hemorrhoids.

THIPPILI CONTAINING BRONCHIAL ASTHMA MEDICINES

I. CHOORANAM:-

1. Thippiliyaathi Chooranam

- ❖ Dosage : 1 – 2 gram
- ❖ Adjuvant : Honey
- ❖ Indications : Cough, *Kabam*, headache.

II. THAILAM:-

2. Nochi thailam

- ❖ Dosage : *Kaasalavu*

  Internal / External
- ❖ Indications : Bronchial asthma, Tuberculosis

III. VADAGAM:-

3. Nelli Vadagam

- ❖ Dosage : *Kottai pakkalavu*
- ❖ Indications : Cough, Eelai

IV. NEI:-

4. Thasamoolaathi Nei

- ❖ Dosage : *Karandi alavu*
- ❖ Adjuvant : Milk
- ❖ Indications : Bronchial asthma

V. LEGIUM

5.Sandamaarutha leg

- ❖ Dosage : *Thaanrikkai alavu*
- ❖ Indications : Bronchial asthma, TB, Cough

j¤gg¤y¤

PIPER LONGUM. Linn...

3.4.2. BOTANICAL ASPECT

Taxonomic classification

Kingdom	-	Plantae
Order	-	Piperales
Family	-	Piperaceae
Genus	-	Piper
Species	-	longum

Vernacular Names:

English	-	Indian long pepper
Hindi	-	Papal, Pipli
Kannad	-	Hipli
Malay	-	Tipli
Marathi	-	Pimpali
Sanskrit	-	Pippali
Tamil	-	Thippili
Telugu	-	Pippallu

HABIT

Stems creeping below; young shoots downy; branching prostrate or creeping with broad leaves, flowering shoots erect; lower leaves 5 – 7.5 cm often rounded ovule, petiole 2.5 – 7.15 cm, upper leaves much narrower with often unequal basal lobes; male spikes 2.5 – 7.5cm, female 1.25 – 2cm, fruits about 0.22cm.

The mature spikes collected sand dried from the commercial from of pippali, roots are known as pippalimulam

Distribution: Throughout India, in evergreen forest; often cultivate.

FRUITS

1. In transaction of the fruiting spike are seen one seeded fruitlets arranged in a circle on the main axis. The pericarp of the fruit has zones of epicarp, mesocarp and endocarp.

2. The secretory cells are present in the outer part of epicarp and round and oval type cells of sclerenchyma mesocarp has thin walled collapsed parenchymatous cells. Endocarp is ovary and filled with dark brown contents.
3. Sometimes the outer end of endocarp forms a dome like structure covering a few cells of endosperm and embryo. The major portions of the fruit under endocarp consists of perisperm, the cells of which alternative, digestive, febrifuge, stimulant and tonic. It used in abdominal distension, ascities, colic, consumption, cough, emaciation, fever, piles, weakness and worms.

CHEMISTRY

The main chemical constituents of long pepper are major alkaloid piplartine which is isolated by Atal. Initially its structure was thought to be a piperidide of trimethoxylin cinnamate acid but the some chemical appears to have been reisolated subsequently given the name piper longumine.

The fruit contains

- n – Cicosane
- D -hydro stigmestesol
- n – Heneosane
- Piperine
- Alpha – thyene.

THE LEAVES OF PIPER LONGUM CONTAINS

- Hentriacontane
- Triacentanol
- Betal sitosterol

USES

1. Piper longum in specifically used in bronchial asthma. To evaluate this action its antihistaminic effects were seen. Piper longum did not showed any significant effect on total quantity of histamine in lungs.
2. The petroleum ether extract of piper longum produce respiratory stimulant effect in smaller doses. Fruit decoction exhibits a potent anti inflammatory activity.It also has an anti bacterial, anti tubercular, Anti – fertility activity.
3. Inhibitory effect of essential oils of Allium sativum and Piper longum on spontaneous muscular activity of liver fluke, Fasciola gigantic

3.4.3. LATERAL RESEARCH:

Thakur Uttam Singh, Dinesh Kumar, Surendra Kumar Tandan, Santosh Kumar Mishra

Abstract

Effects of essential oil of Allium sativum (garlic) and Piper longum (Indian long pepper) were evaluated on muscular activity of whole Fasciola gigantica and its strip preparation. The whole flukes and longitudinal strip preparations of the flukes were isometrically mounted to record the spontaneous muscular activity (SMA) and to evaluate effects of cumulative doses (0.1, 0.3, 1.0 and 3.0 mg/ml) of the plant essential oils. Whole flukes and the strip preparations exhibited continuous SMA without any significant difference in its baseline tension, frequency and amplitude for 2 h. Essential oil of A. sativum produced significant reduction in the frequency and the amplitude of the SMA of whole fluke at 1 and 3 mg/ml concentrations. It caused complete paralysis of the fluke after 15 min of administration of 3 mg/ml concentration. Similar to whole fluke, essential oil of A. sativum (3 mg/ml) also produced flaccid paralysis in the strip preparations of the flukes. Essential oil of P. longum firstly induced marked excitatory effect and then there was flaccid paralysis of the whole fluke following 15 min exposure at 3 mg/ml concentration. Complete flaccid paralysis of the strip preparation was also ensued after 15 min of administration of 3 mg/ml concentration of P. longum. In both the essential oils, the whole fluke and strip preparations did not recover from paralysis following 2–3 washes. In conclusion, the observations demonstrated irreversible paralytic effect of essential oils of A. sativum and P. longum on F. giganticain vitro which might possibly help to developing herbal-based anthelmintic.

3.5. f] J}hp

MOSCHUS MOSCHIFERUS.Linn..

3.5.1.GUNAPADAM ASPECT

Other names:

"f] J}hp NgHj i dNa fUj f Nf S
fhs f j j pw fhkpUf q Nfhkpuf khUQ
ej J}hp ehgpkpU fh z lkhFk
eykhd kf r rhuk Nt j Kf fpar
kj J}hp kj nfejk nt spfhthk
kf j jhd fU\ z pahk thjehr dpAkhFk
rpj J}hp t f fpu rhuggpakhFk
rplrpahq f] J}hpg NgUkhNk".

- Pogar Nigandu1200

Kanagathiraga mirugam, Sumatho mirugam Magaccharam, Vethamukkiyasam, Mathagantham, Karushni, Vaathanaasini, Vakkira Saarappiyam.

"t r dpj j f fypKj i s i farnrhyhjp nadWk
t skhd rejd J iugjhjp nadWk NgU
t r dpj j ntejyhfk tpWthJb nadWk NgU
tpjpjpnkdw kUkhypi r nadWk NgU
mr dpj j thWK iw kjpnadWk NgU
ml thd epfhpyyhg NgUk i j r nrhyNthk
Jr dpj j nrqf jpH thopnadWk NgU
jq i fnaDq f] J}hp thrkjpd NgNu"

- Agasthiyar Panchakaviya Nigandu

Maargam; Maarchaari, Maanmatham, Naabi, Miruganaabi

- Gunapadam Thaathu Jeevam

- **Colour** : *Pazhupudan koodiya Karupu niram*
- **Taste** : Bitter
- **Character** : Veppam

Distribution: -America, Europe, Asia, China, Kashmir, Assam, Russia

Types:

- Kaamruba
- Nepali
- Kashmiri

Action:

- Stimulant
- Tonic
- Anti spasmodic

General characters: (Pothu gunam)

'nrhyyUk tr‰aq fhej‰
RfKjy mZFkg‰dDk
nkyy‰ahH jkfF ehjk
t‰h‰jj‰ahk jiyNeh NaFk
gyY}W fgKk jUk
gfnuh zhg gyKk cz lhk
kyylh ree‰ &lir
khWqf] J}h‰f nfdNd".

Theraperctic uses:

- It mix with betal leaf to use alterative.
- It add in the Mahaaraja mirugaangam, Poornasanthirothaiyam and Aphrodisiac medicines.
- It cures cough and reduces heart disease.
- It cures vomit, headache, sinusitis, fever
- It curves bronchial asthma, vaatham, stomach disorders, and ulcers.

KASTHURI CONTAINING BRONCHIAL ASTHMA MEDICINES

I. YENNAI:-

1. **Santhanaathi Yennai**

External application (Head bath)

- Indication - Eye disease, Sinusitis.

II. MAATHIRAI:-

2. Kasthuri Maathirai

- Dose - 1 Pill
- Adjuvant - Mother's Milk
- Indication - *Kabarogam,* fever, Epilepsy.

3. Amurthasanjivi Kuligai

- Dose : 1 Pill
- Adjuvant : *Piper betle leaf*
- Indication : Cough, *Sanni.*

III. MELUGU

4. Kasthuri Melugu

- Dose : *Payiralavu*
- Adjuvant : Honey.
- Indication : Fever, *Kabam, Vatham.*

IV. KARUPPU

5. Kasthuri Karuppu

- Dose : *½ - 1 Kunrimani*
- Adjuvant : Honey.
- Indication : Bronchial asthma.

f] J}hp

MOSCHUS MOSCHIFERUS.Linn...

3.5.2.ZOOLOGICAL ASPECT

Taxonomic Classification:

- Scientific - Classification
- Kingdom - Animalia
- Phylum - Chordata
- Class - Mammalia
- Order - Artiodactyla
- Suborder - Ruminantia
- Infraorder - Fecora
- Family - Moschidae
- Genus - Moschus
- Species - Moschus moschiferus.

Vernacular Names:

- Sam - Kasturi, Mrigumadha
- Eng - Musk
- Arab E pers - Mishu
- Hind
- Ben
- Guj
- Mah — Kanturi
- Leon
- Can
- Tamil
- Mal
- Duk - Mushk
- Sinh - Urula
- Burma - Kado

SOURCE

Musk Producing animal (musk – deer) is found generally in china, Russia, Assam, central Asia, and pine forests and the inaccessible differ above 8000 feet of Himalayas.

Russle his found in their animals only in the rutting season and undoubtedly for the purpose of attracting the female.

Chinese traders say that the best kind of musk in not obtainal from euchred animals, but is gathered from the favorite hands of the deer, after the retting season, when the animals break the gland in the hoof and empher the contents on the ground. Nussle of this cind in therefore, rarely seen on the market.

SIZE

A little creature not more than 20in. (50cm) high at the shoulder, slightly higher at the croup.

DISTINCTIVE CHARACTERS

The musk Dear holds a place between the deer and the antelopes. It is regarded as an undeveloped form of deer which has not progressed with the rest of its family. But is hornless and has no face glands. These are generally present in all dear, and it has a gall bladder which no deer possesses. In some ways it has taken a special line of development of its own. This is seen in its possession of a caudal gland and a musk gland. The tail of a musk deer is peculiar. It is completely buried in the loin hairs of the anal region and is for the most part naked except for a large tuft at the tip and a tuft at the base which covers its upper surface and sides. The lateral surface of the tail bears in its flaccid skin a narrow slit which is the opening of the caudal gland. The musk gland situated beneath the skin of the abdomen of the males. When fresh its secretion has an unpleasant, pungent, urinary Adour; when dry it acquires the scent of musk. Valued as a commercial product, it induces the persecution of the species. From the great development of the caudal and musk glands, it is inferred that in this deer the females seek out the males in the breeding season. Finally, musk deer have especially mobile feet, the long pointed central hooves and unusually large lateral hooves being well adapted to give it a foothold on showy slopes and slippery rocks. The absence of horns is compensated for by the great development of the canine teeth, particularly in the males.

The musk Deer wears a comet of thick and bristly hairs, almost pithy in structure. The general cooler is a shade of rich dark brown speckled with grey.

DISTRIBUTION

Musk Deer range over a wide area in central and north eastern Asia. The typical form M...Moschiferus is found in Kashmir, Nepal and Sikkim.

HABITS

1. Musk Deer Live singly or in pairs and are generally met with in birch forest above the zone of the pines; at times they come down to lower levels, but always keep in thick cover. They scrope out a shallow form in which they lie concealed and come out to feet in the morning and evenings.
2. The breeding season is believed to be in January and the young are born in June.
3. Which is milky, and bag an unpleasant small. A full grown back gives about two ounces, but specimens containing one - third to one - half of an ounce of must are common. “The odour of musk is so strong that it can be perceivedat a distance when the animal is shot and it is said that the hunters very frequently suffer from the strong odour emanating from the fresh musk as it acts deleteriously on the nervous system eye - sight and hearing.

ACTION

According to Ayurveda, musk is a diffusible stimulant, anodyne, antispasmodic, cardiac, expectorant diaphoretic, and diuretic, laxative, antiseptic and aphrodisiac. It acts principally on the heart and the nervous system. It exhilarates the mind and stimulates the brain, spinal cord ant the peripheral nerves. It improves the circulation and raises arterial tension. It is a stimulant of the urino - genital orgens. It is also reputed to stimulate the respiratory centre.

It is eliminated in the urine, sweat and milk. When taken, its first effects are to stimulate the vascular system and the brain. After a time it acts as a narcotic or soporoific.

Uses:

Musk is largely used in perfumery, its aroma being very lasting and holding more evamescent perfumes with it “perfumers use musk for imparting an odour to scaps, powders, and mixing liquid perfumery”. In indigenous medicines of India musk is used as nerve sedative in epilepsy, hysteria and convulsions in children, and as an antispasmodic and anodyne in low fevers, chronic cough, general debility and impotence. Its fame as a cardiac stimulant is so great that it is almost the last resort when everything else has failed to support the heart. In western medicine as a diffusible stimulant it is used in various adynamic fevers as typhoid, typhus, and typho - remittent

fevers and in all. Typhoid conditions as collapse of delirium tremors, coma, typhoid, pneumonia; as an antispasmodic it is given in “gout, in lock - jaw or tetanus, hydrophobia, epileptic form and hysterical attacks, chorea, whooping cough, hiccup, asthma, colic, laryngismus stridulus, etc.. Musk externally applied to the body acts through the pores as a rejuvenator. In palpitation of the heart it is useful. “It is prescribed sometimes alone and sometimes in combination with ‘Makaradhwaja’ (insoluble sulphide of mercury) and sida cordifiolia”.

ADULTERATION OF MUSK AND THEIR TESTS FOR GENUINENESS

On account of the great demand and the difficulty of obtaining it musk is very frequently adultered with inert substances such as dried blood, liver, etc. Vegetable products such as beans, wheat grains, barley grains, etc., are also mixed with the commercial article at the time of preparing.Whenever any doubt exists; a few grains are extracted from the pod and placed in water.It these remain gravy the musk is genuine, and if these malt the musk is the false or adulterated.Nothere test is to place a few grains on a live piece of charcoal. If these melt and bubble, the musk is pure if they at once harden , it is adulterated.Genuine musk even when buried does not change its odour, luhile impure or adulterated musk gives out an entirely different smell.Aduterated musk can also be detected by touch. Genuine musk is soft and adulterated musk is stuff to the touch.An interesting popular test for musk has been reported from the Punjab. A thread is passed through asafetida and then through the must pod. If after this, the smell of asafoetide remains the music is not genuine.

3.6.mjpkJuk

GLYCYRRHIZA GLABRA. Linn.

3.6.1.**GUNPADAM ASPECT:**

"mjpkJuk NgHj i dNa mwpaf Nf S
mlbf kJfkhqfptp jfKkhF
kjpkJu khJukh kJuhfpu khFk
tyypnadw kJfkh klrp kakhFe
jpjpkJuQ rpwpjrpH Nkhtak khFQ
rpwgghd fh\nkdw kJukhFk
gpjpkJuk gpjj dh rdpAkhFk
NgrpaNjh ujpkJuk NgUkhNk".

Madhugamangi vithagam, Maathurama, Mathurasiam, Mathugama, Madasimayam, Kaashamathuram, Pithanaasini.

DISTRIBUTION

- Cultivated in Punjab and the sub – Himalayan tracts.

The Plant:-

- A tall perennial under – shmb about 1m high; leaves compound; leaflets 4 – 7 pairs; flowers violet in racemes; pods, oblong to linear, flattened; seeds reniform.
- The liquorice of commerce is the dried underground stem and roots. Its outer surface in pale chocolate brown in colour, flexible and fibroces and intemally has a light yellow colour. It has a characteristic pleasant sweet taste.

Description:-

- Perennial small spreading herb with pinnate compound leaves; purple flowers.

Medicinal Parts:-

- Root, underground stem; leaves; Taste: Sweet.

Chemical constituents:

- Glycyrrhizin; glyciyrrhizic acid, It is 50 times sweeter than the normal sugar. Alyeosides, steroids, glucose; sucrose; resin; starch and essential oil.

Medicinal properties:-

- Anti – emetic
- Anti – inflammatory
- Aphrodioiac
- Appetizer
- Blood purifier
- Cooling

GENERAL CHARACTERS:

"fjj¥ah¥ Kgg¥ z¥ahy tUGz js fq
f z N z ha¥c d khjk t¥ffy ty¥nt z F \ lk
g¥jjhYk GUff¥f¥hr ruk M tHjjk
g¥jjkj %Hr i r t¥l ghfk ntgge¥
jjj¥tU thjNrh z¥jqfh khiy
rUt t¥lq fhk¥aNeha jhJellq
&jj¥Uky Mr¥aqfk ,joNeha ,eJ
Fgg Gz k¥Nghk kJ}fnkdf $WqfhNy"

It cures eye disease, cough, tongue disease, pitham.

"Gjj¥fF t¥jjhFQ rejhge jHfFk
Gife jjLfFQ NrlLkj i jg g¥jjNuhfj i j
mjj¥ggw e¥dNkfe j d i d th jjj¥i d
tWjj¥Lktr r¥unk dgh ej¥kJuej i dNa"

- ***F z ghlk %y¥i f tFgG***

Traditional Uses

It is cooling, tasty, induces heaviness useful in opththalmia, deranged bile, oedema, removes pimples and dermal ulcers, decreases thirst and is used in treatment of hairs.

ATHIMATHURAM CONTAINING BRONCHIAL ASTHMA MEDICINES

I. CHOORANAM

1. **Athimathura Chooranam**

   Dosage : *5 – 15 Kunri alavu*

   Adjuvant : Honey

   Indications : Asthma, Cough, fever.

2. **Madhurathi Chooranam**

   Adjuvant : Honey

   Indications : Asthma, Cough, Tuberculosis, *Kabam.*

II. MAATHIRAI

3. Amirthathi Kuligai

- Dosage : 1 – 2 pills
- Adjuvant : Honey
- Indications : Asthma, fever, *Maantham.*

III. VADAGAM

4. Athimathura Vadagam

- Dosage : 2 pills
- Indications : Asthma, Cough.

IV. ELAGAM

5. Kandangathiri elagam

- Dosage : 5 gram
- Indications : Asthma, Cough, *Kabam.*

V. THAILAM

6. Athimathura thailam

- Dosage : External use
- Indications : Cough, *Kabam,* Headache

VI. KIRUTHAM

7. Aswaganthi Kirutham

- Dosage : 5 gram
- Indications : Asthma, *Kabam,* Elaippu.

VII. KASAYAM

8.Athimathura Kasayam

- Adjuvant : Thippili Chooranam
- Indications : Asthma, Cough.

mjpkJuk

GLYCYRRHIZA GLABRA

3.6.2.BOTANICAL ASPECT:

Taxonomic classification:

Kingdom	-	Plantae
Order	-	Fabales
Family	-	Fabaceae
Subfamily	-	Faboideae
Genus	-	Glycyrrhiza
Species	-	G. glabra:

Vernacular names:

English	-	Licorice
Hindi	-	Mulhathi
Karnad	-	Testhamadhu
Marathi	-	Testhamadha
Malayalam	-	Trattimadhuram
Sanskrit	-	Yashtimadhu
Tamil	-	Atimaturam
Telugu	-	Atimadhuramu

THE PLANT

A genus of perennial herbs and under shrubs distributed in the sub tropical and warm temperate regions of the world, chiefly grown in the mediterranean countries and china. It is hardy herb attaining a height upto six feets, leaves are multi folate, flowers are in axillary spikes, papilionaceous, lavender to violet in colour, pods are compressed, containing reinformed seeds. The licorice of commerce is the dried under ground stems and roots. Its outer surface is pale chocolate brown in colour, flexible and fibrous and internally has a light yellow colour. It has a characteristic pleasant sweet taste.

NUTRITIONAL CONSTITUENT

- B_1 B_2 B_3, B_5, B_6 inositol biotin
- Minerals
- Phosphorus
- Manganese
- Iodine

- Chromium
- Zinc

CHEMICAL COMPOUNDS

- Saponins
- Liquritic acid
- Glycrrhetol
- Glabrolide
- Isoglabrolide
- Licoric acid.

FLAVONOIDS AND ISOFLAVONOIDS:

The flavonoids impart the yellow colour to licorice. The main flavonoid is liquid other are

- Isoliquritin
- Liquritingenin
- Glycerin
- Glycerol
- Glycrrhetic acid
- Glycrrhetol
- Glycrrhizic acid
- Glycyrrhizine
- Glyzaglabarin

Some of the above properties are confirmed by extensive research on licorice. It has been proved to be oestrogenic, demulcent, anti oxidant, anti inflammatory, demulcent, anti oxidant, anti inflammatory, anti ulcer, anti allergic, anti spasmodic and expectorant.

Medicinal Uses:-

cholera; cough; epilepsy, haematemesis; heart disease; micturition of urine; skin disease; vomiting; wound, healing.In vitro and in vivo neuroprotective effect and mechanisms of glabridin, a major active isoflavan from Glycyrrhiza glabra

3.6.3. LATERAL RESEARCH:

ABSTRACT

Stroke is a life-threatening disease characterized by rapidly developing clinical signs of focal or global disturbance of cerebral function due to cerebral ischemia. A number of flavonoids have been shown to attenuate the cerebral injuries in stroked animal models. Glabridin, a major flavonoid of Glycyrrhiza glabra (licorice), possesses

multiple pharmacological activities. This study aimed to investigate whether glabridin modulated the cerebral injuries induced by middle cerebral artery occlusion (MCAO) in rats and staurosporine-induced damage in cultured rat cortical neurons and the possible mechanisms involved. Our study showed that glabridin at 25mg/kg by intraperitoneal injection, but not at 5mg/kg, significantly decreased the focal infarct volume, cerebral histological damage and apoptosis in MCAO rats compared to sham-operated rats. Glabridin significantly attenuated the level of brain malonyldialdehyde (MDA) in MCAO rats, while it elevated the level of two endogenous antioxidants in the brain, i.e. superoxide dismutase (SOD) and reduced glutathione (GSH). Co-treatment with glabridin significantly inhibited the staurosporine-induced cytotoxicity and apoptosis of cultured rat cortical neurons in a concentration-dependent manner. Consistently, glabridin significantly reduced the DNA laddering caused by staurosporine in a concentration-dependent manner. Glabridin also suppressed the elevated Bax protein and caspase–3 proenzyme and decreased bcl–2 induced by staurosporine in cultured rat cortical neurons, facilitating cell survival. Glabridin also inhibited superoxide production in cultured cortical neurons exposed to staurosporine. These findings indicated that glabridin had a neuroprotective effect via modulation of multiple pathways associated with apoptosis. Further studies are warranted to further investigate the biochemical mechanisms for the protective effect of glabridin on neurons and the evidence for clinical use of licorice in the management of cerebral ischemia.

3.7.Vyk

ELETTARIA CARDAMOMUM, Maton.

3.7.1.GUNAPADAM ASPECT:

vllhd jpUt zpje jpUfqfeJ}b

,ayghd thyhspnadWk NgU

Fllhd $dnkdWk kpjwFg NgU

$whd ehyhlL ahgby nkdWk NgU

ellhd khjehypnadWk NgU

eykhd rpqfhu nkdwpjwFg NgU

fllhd fllnkdW kpjwFg NgU

fUthd Ntyhprp mjwFg NgNu.

-Pogar nigandu

Vyjjpd NgHji dNa apakgfp Nf S

vajjNakjjpu trfhNj tkhFe

J}ykhQ #lfk Nfhyfk

Jyypah jpwpGlh jpwpjp NtH JbA

thykhk tffpunfQj urkhFk

tskhd gpNwhrrpa Njrgjjpiu

fhykhq fhwzp fhrrgGlhT khF

fhhpakh Nkyjjpd fz fFkh

-Pogar nigandu

Habitat:-

Cultivated for its fruit in many parts of western & southern India (forests of Kanada; Mysore; Coorge; Cochin); Ceylon & Burma.

Parts used: Dried ripe seeds; oil from fruits.

Action:-

Powerful aromatic; stimulant; carminative; stomachic; digestive. These properties due to the essential oil contained in the seeds.

GENERAL CHARACTERS

"njhz il thafTs jhY Fjqfspy
NjhdWk Nehamjp rhukgd Nkfjjhs
cz ilNghy vUq flb fphrruk
coiy thejprp yejpt \QRuk
gz il ntfift jhfNeha fhrKk
ghrQ Nrhgg gpzptpeJ ellk cs
Mz il adstd gpjjk ,itfnfyyhk
Mykhqfko VykUeNj".

It cures throat infection, mouth disease, Ear diseases, vomit, fever, asthma, anemia, tuberculosis

ACTION AND USES

- Aromatic, cardiotonic, carminative, cooling, diuretic, expectorant, stimulant and stomachic.
- Used in consumption difficulty in micturition, piles, respiratory diseases and in retarded mental faculties.
- Useful in Asthma; bronchitis; haemorrhage; renal and vesical calculi; halitosis; cardiac tonic, Anorexia, dyspepsia; gastropathy; burning sensation; debility and vitiated condition of vata.

Therapeutic uses:-

Swasam; kasam; mootrakiricharam; impotency.

ELAM CONTAINING BRONCHIAL ASTHMA MEDICINES

CHOORANAM:-

1. **Elathy Chooranam**

Dosage	:	*1 ½ Varaganedai*
Adjuvant	:	Honey
Indications	:	Bronchial asthma, *Pitham.*

MAATHIRAI:-

2. **Korosanam Maathirai**

Dosage	:	1 Pill
Adjuvant	:	Mother milk
Indications	:	Cough, *Kabam.*

NEI:-

3. Thasamoola Nei

Dosage : *2 Kasalavu*

Indications : Bronchial asthma, ulcer.

THAILAM:-

4.Asanavilvathi thailam

Dosage : External

Indications : Kaasam, *Eelai*, B. asthma.

LEGIUM:-

5.Nira Abaiyathi Legium

Dosage : *Kazharchi kayalavu*

Indications : Bronchial asthma, cough.

KIRUTHAM:-

6. Swasakasa kirutham

Indications : Bronchial asthma, cough, TB.

VADAGAM:-

7. Elathi vadagam

Dosage : *Kazharkiyalavu*

Indications : Stomachpain, *pitham.*

Vyk:

ELETTARIA CARDAMOMUM, Maton.

3.7.2.BOTANICAL ASPECT:

Taxonomic classification:

Kingdom	-	Plantae
Order	-	Zingiberales
Family	-	Zingiberaceae
Genus	-	Elettaria
Species	-	E.cardamomum

Vernacular names:

San	-	Ela; truti; kapita
Eng	-	Cardamom; malorbar cardamom
Hind	-	Elachi
Ben	-	Garale; Chotielachi; chota Elachi
Mah	-	Elachi
Tel	-	Elakkaya
Tam	-	Elakaya; Ella – kay; Elam; Elakgai
Can	-	Elakki
Burm	-	Palah; Bala
Mal	-	Raputage – Plnvar
Pers	-	Kakilahe – Khurd

Habit:-

A leafy dense herb with leafy stem attaining a height of 2 – 3m with thick horizontal perennial rootstock; leaves 60 – 75cm long 2.5 – 5 x 7.5cm wide. Pubescent beneath; panicles several to one leafy stem. 2.5 – 5cm bracts linear, oblong, persistant, 3.75 – 5; calyx 1.25cm; cordla tube shortly exserted, segments 1.25cm lip longer than the corolla segments white sheathed and violet, capsule sub – globose or oblong marked with many five vertical ribs.

Seed:

Seed outer most epidermal layer is testa. The epidermal cells are fusiform. Beneath this is a single layer of small flattened parenchyma and long rectangular cells and oil cells. The inner seed coat has the beak shaped polygonal prisms and the lumen filled by a noddle of silica. The inner layer appears as a hyaline band. In hilum region a vaneul trace is visible with a few cells of xylem and a small group of phloem cells. The perisperm following the inner coat is parenchymatous cells are circular or polyhedral with starch grains along with crystals. Next to perisperm is endosperm containing a

hyaline yellowish mass sand devoid of starch grains. The embroyo is placed at the centre of the seed constituting simple parenchymatous cells.

Distribution:-

Malabar in the western ghats from coorg. Southwards extensively cultivated in the country upto 1500 m.a.s.l.

Description:

A tall herbaceous perennial with brankling root stock 1.5 – 5m in height, leaves subsessile; elliptic or lanceolate with sheating base flowers in panicles which are many for a plant arising from the base the vegetative shoots; upright first and becoming prostrate; lip of the corolla streaked with violet; fruits triloculor; subglobose capsules; marked with many vertical ribs; seeds 15 – 20 per pod; brownish black covered by a thin mucilaginous membrane.

Parts used: Seeds: oil

Properties:-

- Aromatic (seeds)
- Acrid
- Sweet
- Cooling
- Expectorant
- Stomachic
- Diuretic
- Cardiotonic
- Abortifacient

Constituent:-

Fixed oil; essential oil; volatile oil of the seeds the active principle 4 to 8 p.c and contains a considerable amount of terpinyl acetate; cincole; free terpinol; and propably also limonene are present. The following figures may be taken as covering most pure sample specific gravity O. 923 to O. 945; optical station: 240 to 480 refractive index 1.4620 to 1.4675; acid value 1 to 4 ester value 90 to 150; potarsh & salts; starch; hitrogenous mucilage; yellow colouring matter ligneous fiber & ash containing manganese

Uses:-

Cardomomum seeds; have a fragrant taste & aromatic odour; are generally used as masticatory (as a spice & as a flavouring agent). Cardomoms are employed to a small extent in Europe for flavouring sweetmeats. They are valuable in many stomach complaints. An oil extracted from the fruits is used both in pharmacy & perfumery. It is used as carminative is convalescence after diarrhoea. In the form of tincture of powder; cardamoms are used in both in Eastern & western system of medicine, a frequent adjunct

to other stimulant bitters & purgatives. A decoction of cardamom together with their pericarp & Jaggery added in a popular home remody to relieve giddiness caused by biliousness. A compound powder containing equal parts of cardamom seeds; ginger; cloves in a good stomached in ½ drachm doses in atric dyspepsia.Antioxidant and antimicrobial activities of essential oil and various oleoresins of Elettaria cardamomum (seeds and pods)†

3.7.3. LATERAL RESEARCH:

Gurdip Singh1,*, Shashi Kiran1, Palanisamy Marimuthu1, Valery Isidorov2 andVera Vinogorova2

BACKGROUND:

This paper describes the chemical analysis of the essential oil and various oleoresins of Elettaria cardamomum (seeds and pods) by gas chromatography (GC) and gas chromatography/mass spectrometry (GC/MS) techniques. It also compares the effects of the different extraction solvents used (chloroform, methanol, ethanol and diethyl ether) on the antioxidant and antimicrobial activities of the essential oil and oleoresins.

RESULTS:

The essential oil was found to contain 71 compounds. The major components were α-terpinyl acetate (44.3%), 1,8-cineole (10.7%), α-terpineol (9.8%) and linalool (8.6%). The chloroform and methanol oleoresins both contained α-terpinyl acetate (21.8 and 25.9% respectively) as the main component, while 5-hydroxymethylfurfural (28.9%) was the most abundant compound in the ethanol oleoresin. However, very few components (total 0.61%) were found in the diethyl ether oleoresin. The antioxidant activities of the essential oil and oleoresins, studied in mustard oil by monitoring the peroxide value of the oil substrate, were comparable to those of the synthetic antioxidants butylated hydroxyanisole (BHA) and butylated hydroxytoluene (BHT) at 0.02% concentration. The essential oil exhibited strong antibacterial activity against the micro-organisms Staphylococcus aureus, Bacillus cereus, Escherichia coli and Salmonella typhi at 3000 ppm by the agar well diffusion method. Antifungal activity was tested against the food-borne fungi Aspergillus terreus, Penicillium purpurogenum, Fusarium graminearum and Penicillium madriti. The methanol and ethanol oleoresins gave the best results against A. terreus at 3000 ppm by the poison food method.

3.8. fpuhkG

SYZYGIUM AROMATICUM. Merrill & Perry

3.8.1.GUNAPADAM ASPECT.

mjwFg NgH jphpr h thjp nadWk NgU
ml thd jpUfhjejU khjpiu nadWk
mjwFg NgH tUthzpjnkdwjwFg NgU
thUd nkdwpjwFg Nguj jkhrR
mjwFg Ngulh Urp nadWk NgU
kfjjhd m\l fjwf nkdWk NgU
nrjwFg NgH rptuhd nkdWk NgU
ruhf nrhyypt plNlhk y tqfg g+tpd NgNu.

- **mf] jpaH gQrf fhtpa epf z L**

thrnkdw ifaywp aqfq nfhz lhf t d
tUFrf K iwneQr jpNy kfjjhk NgU
fhrnkdw jwpnfeJ}u nkdWk NgU
YNfhNfhr rhpG+lf nkdWk NgU
jhrnkdwtJ ehbNt nudWk NgU
jayhd t tuqfui z nadWk NgU
grnkdw tpilRfej nkdWk NgU
F\hjpr fpuhkgpdl tjjg NgNu.

Habit:-

Small handsome evergreen tree attaining a height of 8 – 10 metres; leaves short; petiolate, elliptic, obovate, sub – acute at both ends 6.8 x 2.5.4cm coriaceous; venation district beneath; cyme terminal; panicle corymbose; flowers in umbellules, small; calyx X 0.3cm long obscurely lobed; corolla calyptrate.

Distribution:-

Cultivated in Western Ghats and kerala.

Part used : Flower bud.

Properties:

Taste : Pungent

Character : Veppam

Bio-transformation : Pungent

General characters:

g‰j j ka f f KWk Ngj‰nahL thej‰Ak NgU

Rj j f t‰uj j f f LgGe Njhd WNkh – nk d W

, y t q f q nfh z l t Uf Nfw Rf k lhU

kykqNf f l Lnk d thoj J

-gjhHjj F z gynahUs t‰s f f k

Action:

- Anti – Spasmodic
- Carminative
- Stomachic
- Anaesthetic
- anodyne
- antispasmodic
- antiseptic
- aphrodisiac,
- aromatic, carminative, circulatory stimulant, expectorant, rubifacient and stimulant.

Therepeautic Uses:

- It is also used to relieve the presence of excessive gas in the digestive tract, Various form of gastric irritability colic dyspepsia and increase the flow of saliva.
- Lavangathi chooranam made of cloves dry ginger, black pepper and fried borax
- Taken in equal measure is useful in bronchitis.
- Cloves heated over flame and kept in the mouth Juice swallowed improves the Breathe and relieves sore throat and strengthens the gum.
- Clove stops puss formation
- Used in aches, colic, cough, indigestion, pain, respiratory disorders, sore throat, spasm and weak eye sight.

Lavangam Containing Bronehial asthma medicines

Vadagam:-

1. **Lavangapathri Vadagam**

Dose	:	*Nellikkaiyalavu*
Adjuvant	:	Honey.
Indication	:	Bronchial asthma, fever.

Yennai:-

2.Lavangaathi Yennai

Dose : 1 drop
Adjuvant : Water, Breast milk.
Indication : Bronchial asthma.

Chooranam:-

3. Kukkulu Chooranam

Dose : *Verukadi alavu*
Indication : Bronchial asthma.

4. Piraai Marunthu

Indication : Bronchial asthma.

Nei:-

5. Poosani Nei

Dose : *3 Kalanchu*
Adjuvant : Milk
Indication : Bronchial asthma, Hicough.

6. Thasamoola Nei

Dose : *2 Kaasalavu*
Indication : Bronchial asthma.

Legium:-

7. Koozhpaanda Legium

Dose : *Yelumichai alavu*
Indication : Cough, *Kabam*, Tuberculosis.

8. Poosanikkai Marunthu

Dose : *Yelumichai alavu*
Indication : Cough, *Kabam*, Tuberculosis

fµuhkG

SYZYGIUM AROMATICUM.Merrill & Perry.

3.8.2.BOTANICALASPECT

Taxonomic classification

Kingdom	-	Plantae
Order	-	Myrtales
Family	-	Myrtaceae
Genus	-	Syzygium
Species	-	Aromaticum

Vernacular names:

Vern	-	Laung
Bengali	-	Laung
English	-	clove
Gujarathi	-	Lavang
Hindi	-	Laung
Kannada	-	Laung
Malayalam	-	Krambu
Marathi	-	Laung
Sanskrit	-	Lavang
Tamil	-	Krambu
Telugu	-	Lavangalu

Parts Used: - Dried flower bud with peduncle.

Taste: Bitter–Acrid.

Description:-

The tree is slender evergreen which grows to a height of 15 to 20m medium Sized, straight with semi erect branches and brittle limb, bearing bushy and greyish bark.

Leaves:

Leaves posses plenty of oil glands on its lower surface, obovate oblong to Elliptic. 6-13 cm X 3.6 cm opposite simple, glabrous, coriaceous and shining with
Short reddish petioles.

Flower:

The flowers produced in terminal corymbose, trichotomus, panicle shorty, Pendunculated and branched from the base with 3-20 flowers per panicle Flowers born at the terminal ends in small bunches are hermaphrodite in nature the stem and Bulbous head for sale “As whole clove” it is essential for the buds to be intack but this Is not important when they are required for grinding.

Major constituents of clove oil

- Eugenol: 48.05%
- Eugenyl acete: 24.26
- Iso caryophyllene: 14.89
- Alpha Caryophyllene: 3.75

Flower bud:

Microscopically it shows the epidermis of the hypanthium and calyx teeth composed of straight walled cells with large stomata, the tetra hydral polen grains, the Fibrous layer of the anther walls, the schizolysigenous oil glands founds in all parts of the drug, occasional isolated pericyclic fibres, the spongy tissue of the hypanthiam, bi – colleteral vascular bundles arranged in ring, the central parenchymatous columella, the cluster crystals of calcium oxalate, the absence of store– cells, starch and prismatic crystals of calcium oxalate.

Chemical Constituents:-

Dried flower bud contain Beta – caryophyllene, Eugenol, Acetate, Methyl salicylate, N – Amylcarbinol, Benzyl alcohol, Furfural, Furfury alcohol, Vanillin, Eugenitine, Eugenon, Galactose, Glucose, Fructose, Rhamnose, Sucrose, Gallotanic acid.

Properties:-

- Anthelmintic
- Aromatic
- Appetizer
- Carminative
- Stimulant
- Stomachic

Medicinal uses:

- Dried flower bud – Anthelmintic, asthma, blood purifier, cold, colic, cough, diuretic, flatulence, tuberculosis.asthma; blood purifier, cloves – Anti – fertility.
- Clove stem oil and leafoil are useful for isolation of eugenol
- For the manufacture of vanillin.
- Clove bud oil is a widely used in food products and in pharma ceuticals.

3.8.3 LATERAL RESEARCH:

Gastro protective activity of essential oil of the syzygium aromaticum and its Major component eugenol in different models:

Syzygium aromaticum, a medicinal plant commonly known as clove, is used to treat toothache, respiratory disorders, inflammation, and gastrointestinal disorders. From the flower buds of S. aromaticum, it is possible to obtain an essential oil comprised of a mixture of aliphatic and cyclic volatile terpenes and phenylpropanoids,Being eugenol as the main component.

The aims of this study were:

(1) to extract theEssential oil of the flower buds of S. aromaticum,

(2) to identify and quantify the main component of the essential oil, and (3) to evaluate its antiulcer activity using different

Animal models. Assays were performed using the following protocols in rats:

Indomethacin-induced and ethanol/HCl-induced ulcer model. Both essential oils from S. aromaticum and eugenol displayed antiulcer activities in the rat models of Indomethacin- and ethanol-induced ulcer. Studies focusing on the possible Mechanisms of gastroprotection were also undertaken using the following Experiments: evaluation of gastric secretion by the pylorus-ligated model, Determination of mucus in gastric content, participation of nitric oxide (NO) and Endogenous sulfhydryl in gastric protection. The results show that there was no Significant effect on the volume of gastric juice and total acidity. However, the Quantification of free gastric mucus showed that the clove oil and eugenol were Capable of significantly enhancing mucus production. With regard to the NO and Endogenous sulfhydryls, the results demonstrated that the gastroprotection induced by Clove oil and eugenol are not related to the activities of the nitric oxide and Endogenous sulfhydryls. No sign of toxicity was observed in the acute toxicity study.

In conclusion, the results of this study show that essential oil of S. aromaticum, as Well as its main component (eugenol), possesses antiulcer activity. The data suggest that the effectiveness of the essential oil and eugenol is based on its ability to stimulate the synthesis of mucus, an important gastroprotective factor. However, further pharmacological and toxicological investigations are required to enable its use for the treatment of gastric ulcer.

3.9. , y t q f g g l i l

CINNAMOMUM VERUM. Presl.

3.9.1.GUNAPADAM ASPECT:

G+ t h d j j ℘hℙ N f h z k h y ℘ n a d W k N g

G+ u z k h k h ℘ a t d h j ℘ n a d W k N g U

M t h d t t ℘ w r h j ℘ n a d W k N g U

m q f g d w e h j ℘ n a d W k j w F g N g U

N j t h d n f h z l y t t n k d W k N g U

$ w ℘ N d h k t h u h d k ℘ j w F g N g U

V t h d N t i u a h l L g a ℘ n u d W k N g U

, a k g ℘ N d h k y T q f g g l i l a j j g v d d k N g N u

Habitat:

Indigenous to Ceylon, Southern India and growing in a wild state in the Western Ghats from the konkan southwards, and in the forests of Tennasserion.

Part used:

Dried inner bark of the shoots from funcated statues and essential oil.

Properties & uses:-

The bark is acrid, bitter, sweet, aromatic, astringent, aphrodisiac, deodorant, stimulant, and alexeteric, and expectorant, febrifuge, diuretic and carminative.

General characters:

‘ r d d y t q f g g l i l j h d F s ℘ H r r ℘ A z l h f F

k ℘ d D k ℘ u j j f f U g i g k H f F q f h z K d d K W

K e j ℘ f f L g g f w W K z % y H G z N g h f ℘ U q

j e j k ℘ F G+ q F o N y f h z ”

j h J e l l k N g j ℘ r U t t ℘ l k h r ℘ a N e h a

k j f ℘ u Q r ℘ y e j ℘ g G+ r R t ℘ l Q r h j ℘ t ℘ l

k h l L k ℘ i u g N g h b U k g y h j ℘ a N e h a f $ l l k w

N t h l L k ℘ y q f j J h ℘.

It cures Brochial asthma, poisons, *vaatham.*

Lavangapattai Containing Bronchial asthma medicines

Chooranam:-

1. **Pathira Chooranam**

Dosage : *Verukadi alavu*

Adjuvant : Honey

Indications : Cough, Asthma, fever.

Vadagam:-

2. **Thaalisathi vadagam**

Dosage : *Kottaipakkalavu*

Indications : Kabam, *Vaatham*, Cough.

Rasayanam:-

3. **Thippili rasayanam**

Indications : Asthma, *Vaatham*, Cough.

Elagam:-

4. **Sarabanga Vilvathi elagam**

Dosage : *1 ¼ Varaganedai*

Indications : *Elaippu*, Cough.

Thailam:-

5. **Arakku thailam**

Dosage : External

Indications : Asthma, fever, Cough.

Maathirai:-

6. **Kukkulathi Maathirai**

Dosage : *Elanthakottai Alavu*

Indications : Asthma, ulcer, piles.

3.9. , y t q f gg l i l

CINNAMOMUM VERUM, Presl

3.9.2.BOTANICAL ASPECT:-

Taxonomic classification:

Clas	-	Dicotyledons
Subclars	-	Moncotyledons
Series	-	Rciphnales (Dor R) Confusion
Family	-	Lauraceae
Genus	-	Cinnamomum
Species	-	Zeylanicum

Vernacular names:

Eng	-	Cinnamon
Hin	-	Dallini, Darucini
Kan	-	Dalcini
Mal	-	Ilavangam, Elavangam
Sans	-	Darusita
Tam	-	Ilavangam, Karuva
Tel	-	Dasini Cekka, Dalcini

Distribution: West coast tropical evergreen and Semi – evergreen frrests.

Description:

A moderate sized evergreen tree, 8 – 18m in height and 50cm in diameter with reddish broken soft bark, having numerous small warts, leave, ovate or elliptic – ovate, shiny above, 3 – 5 ribbed from a little above the base the side ribs ending about three fourths up, the base usually rounded, flowers small in anxillary or sub – terminal cymes or panicles; fruits ovoid berry, dark purple in colour having persistent perianth.

Part used: - bark, oil.

Constituents:

Volatile oil, 2 percent cinnamon acid, rests, tannin, sugar,starch, mucilage, ash etc. Oleum cinnamomum B.P. in distilled from the cortex and consists chiefly of cinnamic aldehyde oxidizing into resin and cinnamon acid; also cinnamyl acetate and hydro – carbon and small quantities, of phellandrene, pinene, linalol, caryophyllene, eugenol etc, also exist. The British pharmacopoea limits the amount of aldehydes to 55 – 65% but aoil may contain as much as 75%.

Cinnamon Oil:-

- Stomachic
- Carminative
- Emmenogogue
- Styptic

Bark: Carminative, antispasmodic, aromatic, stimulant, hemostatic, and astringent, antiseptic, stomachic.

Uses:-

Bronchial asthma, cephalalgia, odontalgia, cardiac disease, diarrhoea, neuropathy, nausea and vomiting, flatulence, fever, halitosis and restoring normal skin colour on the face.

3.9.3. LATERAL RESEARCH:

The abundant use of anti-infective agents resulted in the emergence of drug-resistant bacteria, fungi, and viruses. To overcome the increasing resistance of pathogenic microbes, a variety of medicinal plants have been screened worldwide for their antimicrobial properties. The aim is to find new, effective antimicrobial agents with novel modes of actions. Essential oils derived from aromatic medicinal plants have been reported to exhibit exceptionally good antimicrobial effects against bacteria, yeasts, filamentous fungi, and viruses.

3.10.khrpffha

QUERCUS INFECTORIA, Olivier

3.10.1.GUNAPADAM ASPECT

General characters:

mffuqfs Nghffptpl Mwhj ntgghwWk
nkafFWjpghrpffha nkdNkYe- jffnjhU
ghyHfz NehaNghfFkgdNkf Kenjhiyf Fk
Ntyidafz zha tpskG

-Pogarnigandu

It cures eye disease,mouth disorders,asthma.

khrpffhar Ritf \ha kUtpa jpfj K\ zk
Ngrpa fL tp ghfk ngUQrj ujjj NjhLk
VRWkjp rhuk gpd vOKis ujj ntlif
MRW %y kdwp abjjssy fzl Nuhfk

Distribution:-

Native of Greece; Asia Minor; china and Iran; also found in Kumaun, Gahwal and Bijnor forests.

The plant:-

A small tree or shrub 2 – 5 m in height with grey bark leaves riged, 4 – 6cm long; dendate yellowish in colour, the galls arise as excrescences on the young twigs; consque to the deposition of eggs by a small hymenopterous insect known as Adeleria gallae – tinctoriae.

The galls are spherical or pear shape a smooth and shining surface bearing spinous projections. It is chestnut brown in colour the galls collected before the emergence of the insects are best such galls have inner soft tissue of & deep greenish yellow colour those collected after the escape of insects will have perforations. The galls generally vary in size; colour and appearance.

Past Used : galls

Taste : Astringent.

Properties : Astringent, Acrid, Cooling, haemostatic, Constipating, Vulnerary, expectorant, Tonic.

Uses:

Useful for dysentery diarrhoea; stomatitis; cough; bronchitis; dyspepsia; fever; gonorrhoea; diabetes; tonsillitis; hyperhidrosts; leucorrhoea and general debility. It is very useful for blackening of the hair and in the antitodal treatment in cases of poisoning by aconite datura; nux – vomica and antimony.

Maasikkai containing Bronchial asthma medicines

Kuligai:-

1. Maruthuva amirtha kuligai

Dosage : 2

Indications : Bronchial asthma, *Kabam.*

2. Amirthaathi Kuligai

Dosage : 1 Pill

Adjuvant : Mother milk

Indications : Cough, fever.

Legium:-

3. Venpoosani legium

Dosage : *Punnai kkaiyalavu*

Indications : Anemia.

Melugu:-

4. Kiragani Kabaada Melugu

Dosage : 5 to 10 grams

Indications : Diarrhoea, dysentery.

5. Rasaganthi Melugu

Dosage : *Sundai alavu*

Indications : *Kuttam, Kiranthi, Soolai*

Maathirai:-

6. Katturaathi maathirai

Indications : diarrhoea

3.10.2.QUERCUS INFECTORIA, Olivier

BOTANICAL ASPECT

Taxonomic classification:

Phylum	-	Angiospem
Sub – phylum	-	Dicotyledons
Division	-	Lignosae
Order	-	Fagales
Family	-	Fagaceae
Genus	-	Quercus
Species	-	Infectoria

Vernacular names:

Eng	-	Sak gall; Dyer's sak gall
Hind	-	Majuphal; muphal
Kan	-	Macike
Mal	-	Masikka; Mayakku
San	-	Kaisika; Mayaphalah
Tam	-	Masikkai; Macakkai
Tel	-	Maslkaya

Part used: Galls

Properties: Astringent, Styptic, Tonic.

Formation of oak gall:-

Galls are pathological outgrowth formed on the twigs of the Dyer's oak, Quercus infectoria Oliver, family – Fagaceae. These excrecences arise in consequence of the deposition of an egg by a small hymenopterous insect Alleria gallo tinctoriae Oliver (cyrnips galloctinctoriae hastig) Family – cynipidae, often known as the gall – wasp.

On emerging from the egg, the group pieces the delicate epidermis near the growing point of the twig, where the egg was deposited, and a secretions from its jaws stimulates a rapid growth of tissue which quickly envelops the grub and forms a spherical excrescence. If the egg fails to hatch, no gall is produced and galls ceases. The grub develops at the centre of the gall, charges into pupa and finally the image, or perfect insect, emerges from the pupa and bores a tunnel about 2 to 2.5mm. In diameter to

outside of the gall and escape as a small four winged flying insect. The eggs are laid in spring or early summer and the insect escapes after five to six months.

Gallo – tannic acid, the 'Tannic Acid' of commerce is a pale yellow, amerhous substance yielding bluish – black precipitates with solutions of ferric salts. It an aqueous solution darkens when exposed to the air with simultaneous formation of gallic acid and sometimes also of ellagic acid.

These galls which arise as excrescences on the young twigs are caused by the deposition of egg by a small hymenopterous insect. Adleria Gallae Tinctoriae Oliver. The female fly lays the egg anor in the cambium of a young shoot. The egg develops into a larva and gets surrounded by tissues of the developing gall. The galls are collected before the escape of the insect and are well dried. They are spherical or pear shaped and measures 5 to 6 mm in diameter.

Constituents:

- The principal chemical constituents of galls in Tannin or Tannic acid (Galls – tannic acid) 50 – 60 or 70% and 30% of gallic acid. Oak bark contains upto 16% of tannic acid to which it owes its effect.
- Alleppo galls contains 50 to 60% of tannis.
- Chinese galls contains 70% of tannins.
- Tannic acid is found to the largest extent in galls, though it occurs in a moderate amount in numerous plants. Main constituent of tannis in petadigalloglucose

Galls contain on principal constituents from 50 to 70% of tannis, which yields gallo tannic acid. They contains also a little Gallic acid (2 to 4%) ellagic acid, cyclogallipharic acid sugar & starch.

Chemistry or chemical compounds:-

- Proto catechuic acid ester
- Infecoryl aster (M+196, $C_{10}H_{12}O_4$)
- 2, 6 dimethyl proto catechuic acid methyl ester
- Phenolic – quarcanaphthalene ($C_{12}H_{12}O_6$)
- Ellagic acid glycoside – quercoside ($C_{32}H_{36}O_{22}$)

Gallic acid:-

- The tannis react with T – proteins to produce typical tannin effect, medicinally.
- Bleeding disorders – including functional bleeding haematochezia (blood in stool) ulceration, topically for bleeding wounds, bleeding piles.
- Indestinal disorders – diarrhoea, dysentery, haemorrhoids, intestinal parasites, rectal peolapse.
- Excessive discharge such as enuresis, frequent urination, hyperhidrosis (excessive sweating) leucorrhoea, night sweating involuntary seminal expression.

Characters:

- Pure gallic acid assures the form of white or nearly colourless feathey crystals of a beautiful silky lusture.
- When it's strongly heated, the gallic acid in converted, into metagallic acid.
- It is soluble in alcohol, sparlingly in ether.

Uses:-

Gall nut is used externally for its astringent effect, it is used ointments from the treatment of piles and in plasters. The tannic and Gallic acids extracted from the galls are often used in dysentery and diarrhoea . The galls are said to find extensive applications in tanning, dyeing and in the manufacture of ink.

3.10.3. LATERAL RESEARCH:

Antiinflammatory evaluation of alcoholic extract of galls of*Quercus infectoria*

Abstract

Galls of *Quercus infectoria* Olivier (Fagaceae) possess pleiotropic therapeutic activities, with particular efficacy against inflammatory diseases. The present study was undertaken to evaluate the effect of alcoholic extract of *Q. infectoria* galls on various in vivo and in vitro experimental models of inflammation. Oral administration of gall extract significantly inhibited carrageenan, histamine, serotonin and prostaglandin E_2 (PGE_2) induced paw oedemas, while topical application of gall extract inhibited phorbol-12-myristate-13-acetate (PMA) induced ear inflammation. The extract also inhibited various functions of macrophages and neutrophils relevant to the inflammatory response. In vitro exposure of rat peritoneal macrophages to gall extract ameliorated lipopolysaccharide (LPS) stimulated PGE_2 and nitric oxide (NO) production and PMA stimulated superoxide ($O_2\text{-}^{-}$) production in a dose dependent manner. Gall extract also scavenged NO and $O_2\text{-}^{-}$.

Probing into mechanism of NO inhibition in macrophages revealed gall extract to ameliorate the induction of inducible NO synthase (iNOS), respectively without any inhibitory effect on its catalytic activities even at higher concentrations. Gall extract also significantly inhibited formyl-Met-Leu-Phe (fMLP) stimulated degranulation in neutrophils. These results suggest that alcoholic extract of galls of *Q. infectoria* exerts in vivo antiinflammatory activity after oral or topical administration and also has the ability to prevent the production of some inflammatory mediators.

3.11. Rf F

ZINGIBER OFFICINALE, Rosc.

3.11.1.GUNAPADAM ASPECT:

Other names:

mUffd› mjfk› Mujufk› cgFyyk

cyHej ,Qr› fLgjj›uk› RfF› Rzb› nrhzb›

nrsgddk› nfstHzk› etRW› ehf›uk› knescuja›

t›rtNg\[k› t›l%ba mk›Hjk› NtHfnfhkG

- Fzghlk %y›if tFgG

RfFzlgNgH jidNa nrhyyfNfS

fzbahqfhy tjk t›RtkhFk

KfFDl jhfkhk Ngr\KkhFk

Kff›ukhq fwgj›uQ r›WqfpdF

eff›Dl jhfj›h›gQ rhjfKkhFk

rhqfkh AwgGkhq frgGkhFk

gff›d›lj j›w›Njh\khd›ahFk

gh›ghi\ehknkyyhQ RfFffhNk.

- **Pogar Nigandu – 1200**

Sundi, Kaalveetham, Visuvam, Nagam, Pesham, Kasapu, Urappu.

Habit:-

A herbaceous, rhizomatous perennial, reaching upto 90cm in height under cultivation. Glabrous herb root stock perennial bearing many sessile tubers, leafy stem 1 – 1.3m, leaves 15 x 35 x 2.5cm spike 5.75 x 2.5cm diameter peduncle 1.25 to 2.50cm bracts about 2.25cm, corolla segments lanceolate stamen dark purple as long as the lip vary rarely flowers and never seen in seed.

The Plant:

A slender, perennial rhizomatous herb, leaves linear, sessile, glabrous, flowers yellowish green in oblong, cylindrical spikes, unsheathed in a few scarious glabrous bracts, fruits oblong capsules. The rhizomes are white to yellowish white in colour irregularly branched, somewhat annulated and laterally flattened. The growing tips are covered over by few scales. The surface of the rhizome is smooth and if broken a few fibrous elements of the vascular bundles projects out from the cut ends.

General Character

F iykej neQnrhpgG Njh\Nkggk koh
%ykpiuggpUkd %fFeH – thyfg
Njh\ kjprhue njhlHthj FdkeHj
Njh\ khkk NghfFQ RfF

thjg gpzptapWjw nr tpaha
typjiy typify typapU tpOeH
rjj njhLtU Ngjpg gyNuh
rpfkypKfkf Kftpb fgkhH
rjr Rukthp Ngjr RuNeha
njwpgL nkdnkhopFtHGtpjdpNy
aJf FjT aJfFjthnj zktpjp
apiyet RWF zKsNt RfF

- **gjhHjj F z gynghUs tpsffk**

It cures vaatham, ear disease, dysentery, fever, headache.

Rawe ginger is acrid, thermogenic, carminative laxative and digestive. It is useful in anorexia, vitiated condition of vata and kapha. Dry ginger is acrid, thermogenic, appetizer, and laxative, appetizer, laxative, aphrodisiac and carminative.

Therapeutic Uses of dried Ginger

- Ginger possesse Anti- Oxidant Properties and may be added to edible oils and fats to protect them against oxidative rancidity. This is due to phenolic constituents of ginger.
- Ginger also prevents lipid oxidation due to shogaol and zingerone.
- Ginger is valued is medicine as a carminative and stimulant to the Gastro-intestinal tract. It is used in home for flatulence and Colic. Ginger contains anti histaminic factor.
- It is include among anti depressents and it forms and ingredient of some anti-narcotic preparations
- An extract of ginger is used as an adjuvant to many tonic and stimulating remedies. Externally ginger is used as local stimulant and rubefacient.
- Alcoholic extracts of spice have been found to stimulate the vasomotor and respiratory centres of anaesthetized cats they also stimulate the heart.

- In veterinary practice, ginger is used as a stimulant and carminative in atonic indigestion of horses and cattle.
- The rhizome has been found to be a new source of proteolytic enzyme.

Chukku containing Bronchial asthma medicines

Thailam:

1. Chukku thailam

Dosage : External

Indications : Cough

Chooranam:

2.Chukku Chooranam:

Dosage : *3 viral alavu*

Adjuvant : Honey

Indications : Bronchial asthma

Kiyazham:-

3. Thiratchathi Kasayam

Indications : Bronchial asthma

Maathirai:-

4. Kaasa kulaanthaga maathirai

Adjuvant : Ginger juice

Indications : Bronchial asthma

Rasayanam:-

5.Thippili Rasayanam

Indications : Bronchial asthma, Couga

Kirutham

6. Swasa Kaasathirku Kirutham

Dosage : 1 Spoon

Indications : Bronchial asthma

Rf F

ZINGIBER OFFICINALE.Rosc.

3.11.2.BOTANICAL ASPECT

Taxonomic classification:

Kingdom	-	Plantae
Order	-	Zingiberales
Family	-	Zingiberaceae
Genus	-	Zingiber
Species	-	officinale

Vermacular Names:-

Tamil	-	Dried – shukku, Chukku, Fresh – inji
English	-	Ginger.
Sanskrit	-	Sranga Vera, Sringa – beram;
Hindi	-	Adrak, ada
Ger	-	Ingwer
Kannad	-	(Dried) – Vona – shunti
Malayalam	-	Chukka
Telugu	-	Dried – Sonti

Distribution:-

Widely cultivated in tropical Asia. Ginger is cultivated in many parts of India, and on large scale in the warm, moist regions, chiefly in Madras, Cochin and Travancore,

It is an underground rhizome.

Habit:

An herbaceous, rhizomatous perennial, reaching up to 90cm in height under cultivation.

Root:

Adventitious

Leaves:

Narrow, Sub-sessile, linear – lanceolate, 17.0 cm x 1.8cm, dark green, evenly narrowed to form a slender tip with stem –clasping sheaths.

Parts used: Rhizomes (raw as well as)

Properties:-

Raw ginger		Dry ginger
❖ Acrid	-	Acrid
❖ Thermogenic		Thermogenic
❖ Carminative		Emollient
❖ Laxative		Appetiser
❖ Digestive		Laxative

Vitamins:-

❖ Thiamine	-	0.06 mg / 100 gm
❖ Riboflavin	-	0.03 mg / 100 gm
❖ Niacin	-	0.60mg / 100 gm
❖ Vit C	-	6.0 mg / 100 gm
❖ Carotene	-	40 mg / 100 gm

Chemistry:

The major chemical constituents are oleoresin – 5.3 to 8.6% comprising of non – volatill pungent principles. Gingerol mainly 6 – gingerol, non – pungent substances and volatile oil containing sequiterpene hydrocarbon namely alpha – zingiberene,

Action and uses:-

used in abdominal distention cholera, colic, diarrhoea, eye disease, dypepsia, fever, flatulence, heart disease, hysteria, nausea, nervous disease, tympanitis.

Used extensively in traditional medicine for its specific action in rheumatism and inflammation of liver.Useful for Dropsy; Otalgia, Cephalalgia; asthma; cough; colic; diarrhoea; flatulence; anorexia; dyspepsia; pharyngopathy; cholera; nausea; vomiting elephantiasis and inflammation.

Used to treat Indigestion hyperacidity, cough, Asthma, dyspepsia, Polyuria, ascites, diarrhoea, oedema, stomach disordes, anemia, disease of kapham, cardiac diseases.

3.11.3. Lateral Research

The use of Ginger (zingiber officinale Rose) as a potential anti – inflammatory and anti thrombotic agent. -Thomsan M. et al

The effect of an aqueous extract of Ginger (Zingiber officinale) on serum cholesterol and triglyceride levels as well as platelet thromboxane B (2) and prostaglandin Ec2 production was examined. A raw aqueous extract of ginger was administrated daily for a period of 4 weeks, either orally or intraperitoneally to rat. Fasting blood serum was

investigated for thromboxane – B (2), prositaglandin – ECX2), cholesterol and triglycerides A low dose of ginger (50mg l kg) administrated eightr orally or I.P. did not produce any significant reduction in the serum thromboxane – Bc2) levels when compared to saline treated animals. However, ginger administered orally caused significant changes in the serum PGR(2) at this dose High doses of ginger (500mg 1kg) were significantly effective in lowering serum PGE(2) when given either orally or IP. However, TXB (2) levels were significantly lower in rats given 500mg1kg ginger orally but not ID A signiticant reduction in serum cholesterol was observed when a higher dose of ginger (500 mg 1 kg) a significant reduction in the serum cholesterol was observed only when ginger was administered levels were observed upon administration of either the low or high dose of ginger there an cholesterol lowering anti thrombotic, and anti – inflammatory agent.

3.12. DISEASE REVIEW

Iraippu Noi **(Bronchial asthma)**

3.12.1.SIDDHA ASPECT

Other names:

Izhuppu noi, Swasam, Thoivu, Eelai, ***Swasakaasam.***

Nature of the disease:

Swasakasam not comes under any perfect cause. It produces chest pain as if the chest is tightened. There will be breathlessness with difficulty in expiration as well as inspiration. The expiratory noise will makes a sound of musical instruments such as flute, lute and *veenai*. Further, even if attempt is made for expectorating the sputum it does not come out easily.

Genesis of the disease:

fhy ngUfF z TnghUs j z zhkhwy
fUjpUky kpfy thejp Fsphejfhww
khy nraJehsNjhWk tUjJqfharry
kejd Kaphepiy apybfjhqfs
Vy rjNgjp tplghz L Giffs
,yfpaneyyhjpkzpr Riz Alnryyy
Nky topawrpythpDkpiugghk NehA
Kdpthfs tpskgpdhNu

It is considered that the disease may develop due to the following factors:

- The body natural protection power is reduced because of unwanted foods and behaviours. In such condition the disease develops when food which can aggravate the activity of kapha are taken or by any other act which aggravate the same.
- As a result of allergy due to grass, plant, rice and ragi, may also triggers the disease.
- By smelling some foul smelling substances which are not good to the body to develop the episodes of disease.

Other factors affecting the disease:

- Eating foods which will induce excessive *kapha.*
- Exposure to chill air.
- Living in the mountains.

Prodromal symptoms:

Generally, those who have suffered from this disease chronically can recognize the Prodromal symptom and also the intensity of the disease allergic to them. The patient on smelling the food and air which are allergic to him, will develop watery discharge from the nose, sneezing, chest pain as if the chest constricted. Blockage of natural respiration, pain at the region of ribs with breathlessness distension of abdomen and sweating of body are other symptoms of the disease.

In ancient Tamil book, the disease has not been mentioned separately. But it has been mentioned as two separate entities, viz. under cough disease as '*Swasa kasa'* and under fire disease as '*Swasa pitta'*. The signs and symptoms of these two have also been mentioned.

Types of Swasakasam:

- Vali iraippu (Sitriraippu)
- Iya iraippu (Periraippu)
- Iyavali iraippu (Thinaraliraippu)
- Mukktra iraippu (Manthara iraippu)
- Melnokku iraippu (meliraippu)

Signs and symptoms:

"t d i k a h a f Nf h i o f l b , Uk tO k
kheh f k NghyNt thq F Q R t h r k
j z i k a h a r n r Uk Y z l h k b f f b f F Q
ru z k yhkNy t a W %J k
e d i k a h a ehr aJ j z yNgh yh F k
ey eJ l k G t ww tUq FuY q f k K k
c z i k a h A z z h f f Y}Wq Nf z
AoeJNk R t h r f h r j j n d hgNg".

-a+f i t j j a r ejh k z

Vali iraippu noi (or) Arpa Swasam(or) Soothira suvaasam:

The activity of vatha dhosha gets aggravated due to, intake of food which is not digested easily, wandering in the hot sun rays, eating of substances such as tubers. The patient may feel a sensation as if nothing is inside the chest. Inspite of all these effects, the disease does not cause severe hardship to the patient.

Iya iraippu noi (or) Manthara swasm (or) Thamaraga suvaasam:

The disease is caused by the excessive activity of kapha, foods which aggravate the kapha and also on exposure to rain and chill air. The excessive activity of kapha in the body also affects in the head, causes nasal obstruction and watery discharge from the nose. But these symptoms will subside within few hours. The other clinical features are:

- The patient will have a sensation of constriction type of chest pain with difficulty in expiration. Sometimes patient may fear that may even die in view of his inability to breath. When the patient coughs a bit and mucus is expectorated out, he may have relief. If the patient does not cough and there is no expectoration of sputum, patient will experience severe difficulty in expiration and he may not be even in a position to lie on the bed and stand.
- There will be also sweating over the forehead, blackening of face, chillness of limbs. The eyes may appear as if swollen due to breathlessness. Dryness of tongue, shivering of body, dyspnoea and inability to sleep in the bed are other features of the disease.

Iyavali iraippu (or) Perirappu (or)Vichinna suvaasam:

*I*n this disease, as the kapha and vatha dosha are deranged together, the signs and symptoms will be severe. In addition to the signs and symptoms of *Iraippu noi*, the following clinical features may be seen due to the derangement of vatha dosha and its association with *udhana vaayu*: inability breath in and breath out with intermittent dyspnoea, distension of due to retention of stool and urine, dryness of tongue, congestion eyes with pain, pain at the region of reproductive organs, sweating, incoherent talk, feeling sad, occasional behavioral disturbance, giddiness, sensation of rotation of body, etc.

Mukkutra iraippu noi (or) Thinaraliraipu (or) Maghaa suvaasam:

In this disease, all the three will aggregate together. In view of this the upward directional and downward directional, diffuse directional and central directional factors are deranged one by one. In addition, the severe body structures will also be reduced in strength and these results in severe Iraippu noi. The prodromal symptoms are dyspnoea, astonishment, shivering of the body and feeling sad. Later, wheezing may develop. The breath sounds will be similar to a big cows sound. The other features of the disease pain in the chest is tied tightly, giddiness occurs frequently, retention of urine and with distention of abdomen, incoherent talk, perplexion, decreased activity of five senses, pain throughout the body, excessive sweating in the forehead.

***Melnokkuiraippunoi*:**

If any of the disease mentioned above continues for many days without response to treatment, becomes upward directional the udhana vaayu loses its strength and be in such a situation, expiration may not be possible. The patient will develop dysnoea and his eyeball will be prominent. There may be dryness of mouth. Patient may be unable to speak; he may appear astonished and will not lie down on the bed; he may look upward as if the mouth opened; he may also attempt to exhale. If proper treatment is given at this juncture he may survive. Otherwise, he may fall unconscious with darkening of face and may die with mouth open.

Pulse examination:

"fgkyyhJ fhrRthrk thuhJ"

Kabanadi,

VathakabaNadi,

Kapha pitha naadi are the classical pulse for Swasakasam.

Some other factors in the genesis of disease:

Sputum:

- If the sputum is found excessive in quantity, light weight and foamy, it is considered that the disease developed due to kaphadosham.
- If the sputum is black in color, hard and with smell of flesh, it will denote kaphadosham.
- If it is found white like pus and mixed with yellow color, it will denote pithadosham.

ERAIPPU NOI (BRONCHIAL ASTHMA)

3.12.2. MODERN ASPECT

Definition:

Asthma is a chronic reversible inflammatory disease of the airways characterised by recurrent paroxysmal attacks of dyspnoea chiefly expiratory in nature accompanied by wheeze which may subside spontaneously or with treatment.

Aetiology and pathogenesis:

Asthmatic patients are having a hyper-reacting bronchial tree and numbers of factors may produce obstruction ,namely spasam of the bronchial smooth muscle ,oedema of the bronchial mucosa ,and presence of mucus in the bronchial lumen.Bronchoconstriction may be due to varies factors,known and unknown .Known substences are Histamine ,slow reacting substence of Anaphylaxis,Platelet activating factor ,Eosinophil chemotactic factor of Anaphylaxis ,Bradykinin,Prostoglandins,5-HT and other unidentified substences liberated from the mast cells.The factors responsible for releasing these mediators are allerge,infection,exercise,psychological factors,change of temperature and humidity ,smoking etc.

Allergy:

Allergens may be inhaled or ingested.Inhaled allergens are house dust,pollens,dander,kapok,and feathers.The antigen in the house dust is derived from feathers ,mite,dermatophytes which live in bedding and mattresses and fungus like A.Fumigatus .Ingested allergens include various substences such as egg,fish,crab,chocolate,aspirin,penicillin,iodide,etc.This type of allergic asthma develops in atopic individuals mediated by antibodies.These antibody belong to a type of immunoglobulin called IgE this is called hypersesitivity reaction.Air-borne pollution of the environment produces so called “Tokyo –Yokohma “ or “New Orleans” asthma .Meat wrappers asthma ,Barkers asthma,wood workers asthma are other examples .Asthma may also develop by type III hypersensitivity mechanism mediated by IgG.

Infection:

Infection of the bronchial mucosa causes airway obstruction due tooedema of the mucosa and overproduction of mucous .Apart from this ,bacterial antigen may produce an allergic response .Streptococcus pneumoniae ,H.influenza and viruses are responsible for infection .Asthma in children and middle aged people are mainly due to this.

Exercise:

It may precipitate asthma or may worsen the asthmatic state .This is called exercise induced asthma.

Psychologicalfactors:

Various psychological factors particularly stress may precipitate an attack.

Temperature and humidity:

Changing temperature and humidity may cause obstruction to the airways in the asthmatic subjects.

Smoking: Cigarette smoking also causes airway obstruction.

INTRINSIC AND EXTRINSIC ASTHMA:

Asthma can be divided into extrinsic and intrinsic varieties.

The main points of distinction are given below:

	Points	Intrinsic Asthma	Extrinsic Asthma
1.	Precipitating allergin	Nil	Present and external
2.	History of allergy	Absent	Present
3.	Family history of Asthma,Eczema, hay fever,urticaria	Usually present	Usually present
4.	Age of onset	Middle age	Childdood
5.	Allergic skin tests	Negative	Positive
6.	IgE level	Normal	Raised

Table 1

Clinical Features:

During attack

Attack usually stars in the late hours of the night or in the early hours of the morning.Onset is sudden and may be preceded by a feeling of tightness of the chest.Patient becomes very much dyspnoeic and feels as if there is less air in the room.He rushes to the window, opens it and pants for breath .After sometimes he coughs and brings out a little phlegam and gradually the attack subsides within an hour or so.

Signs:

General survey:Facies is anxious ,decubitus-patients sits upright or in stooping forward posture, accessory muscles of respiration are very much prominent ,expiratory wheeze is present ,central cyanosis may be present ,respiration rate is hurried 25-40 per minute ,expiration is prolonged and laboured ,pulse rate is rapid,BP shows systolic elevation of pressure .Temperature is usually normal .Sweating is present.

Chest is held in a state of full inspiration but as the diaphragmatic function is preserved the lower ribs normally move outward .During inspiration the skin over the chest is sucked inside.Vocal fremitus is slightly increased unless there is pre-exsistent emphysema .Expiratory rhonchial fremitus is present .Percussion shows hyper-resonant note .Wheezing is polyphasic and though heard in both phases of respiration yet they are more prevalent during expiratory phase.

Status asthmaticus (Acute severe asthma):

Severe asthma is diagnosed by the following features:

- Severe breathlessness.
- Inability to speak with one breath
- Restlessnes and anxiety.
- Presence of large amount of bronchial secretion.
- Prominent central cyanosis.
- Pulse rate more than 130 per minute.
- Pulsus paradoxus.
- Diminished level of consiousness.
- Severe hyperinfaltion of the chest.
- Markedly diminished breath sound with practically absence of rhonchi.

Specialinvestigations:

- Blood: Slight eosinophilia is present but the absolute count is less than 1000/$mm^{3.}$ Other blood changes are elevated IgE and rarely elevated SGOT, SGPT, LDH, CPK, OTCand ADH.
- Sputum shows eosinophils, Charcot-Leyden crystals, Curschmanns spirals and Laennec's pearls and creolas bodies apart from the infective agents.
- X-ray of chest shows overinfection of lungs in acute attack but may show emphysematous changes in late stages.

- Pulmonary function test: The degree of airway obstruction can be measured by FEV_1 and FEV_1/FVC ratio both of which are reduced and improves after use of bronchodilators .The diffusing capacity is usually normal.
- Blood gas analysis shows diminished PaO_2 and raised PaO2in status asthmaticus but normal in mild attacks .In earlier status respiratory alkalosis is present but in severe late stages respiratory in acidosis results.
- Skin test: By prick test hypersensitivity reaction to various antigens can be obtained.
- ECG shows normal features except Tachycardia.But sometimes
- P.pulmonale, Right axis or RBBB pattern may be observed
- Bronchial provocative test with methadolin or histamine may be of help in presence of uncertain diagnosis.

Complications:

- Status Asthmaticus
- Secondary infection –Bronchitis, Tuberculosis.
- Emphysema of lungs
- Bronchiectasis.
- Pneumothorax,pneumo mediastinum
- Right heart failure in late stages called chronic cor pulmonale.

Clinical diagnosis

- **Episodic asthma**: Paroxysms of wheeze, dyspnoea and cough, asymptomatic between attacks.
- **Acute severe asthma**: Upright position, use accessory respiratory muscles, can't complete sentences in one breath, tachypnea > 25/min, tachycardia > 110/min, PEF < 50% of pred or best, pulsus paradoxus, chest hyperresonant, prolonged expiration, breath sounds decreased, inspiratory and expiratory rhonchi, cough.
- **Life-threatening features**: PEF < 33% of pred or best, silent chest, cyanosis, bradycardia, hypotension, feeble respiratory effort, exhaustion, confusion, coma, PaO2 < 60, PCO2 normal or increased, acidosis (low pH or high [H+]).
- **Chronic asthma**: Dyspnea on exertion, wheeze, chest tightness and cough on daily basis, usually at night and early morning; intercurrent acute severe asthma (exacerbations) and productive cough (mucoid sputum), recurrent

respiratoryinfection, expiratory rhonchi throughout and accentuated on forced expiration.

Physiological diagnosis

- Demonstration of variable airflow obstruction with reversibility by means of FEV1 and PEF measurement (spirometer and peak flow meter).
- **FEV1** < 80% of pred – PEF < 80% of pred.
- **Reversibility**: A good bronchodilator response is a 12% and 200ml improvement in FEV1 20 min after inhalation of 200ug salbutamol (2 puffs).
- **Diurnal peak flow variation**: Normal variation: Morning PEF 15% lowers than evening PEF. With asthmathis variation is > 15% (morning dipping).
- **Provocation studies**:

  (a) **Exercise:** A 15% drop in FEV1 post exercise indicates exercise induced asthma.

Differential Diagnosis:

- Cardiac Asthma
- Chronic bronchitis
- Obstruction of trachea and bronchus
- Uraemic asthma
- Bronchopneumonia
- Tropical eosinophilia
- Allergic aspergillosis
- Pulmopnary embolism

3.13. PHARMACEUTICAL REVIEW

CHOORANAM

Chooranams are fine powders of drugs .The term *chooranam* may be applied to the powder of a single drug or a mixture of two or more drugs, which are powderd seperately prior to their being mixed to homogenity.

Equipment required:

1. A mortar and pestle
2. A fine sieve or fine cloth of close mesh.

Note: In large scale manufacture, in factores comminutors, pulvirisers and ball mills are employed for powdering.Sieving is performed by mechanical sifters which handle large quantities of drugs in a short time.

Process of preparation:

The drugs enumerated in the recipe are clean and in well dried state. The drugs which are to be used in the preparations should be taken from recently collected material.

However, drugs like licorice, long pepper, tail pepper, nutmeg, clove, greater galangal, sukku are prepared from fairly aged stock, provided they are not intested with pests, deteriorated or spoiled or developed rancidity.

In general the aromatic drugs are slightly fried, in order to enhance their aroma and milling properties.Any extraneous material, organic or inorganic, should be removed from the drugs by close inspection.

The chooranam should be so fine as to be called amorphous and should be never damp.The fineness of the sieve should be 100 mesh or still finer.

Storage:

The prepared dry powder should be allowed to cool by spreading and mixing, prior to packing.They should be stored in tightly stoppered glass, polythene or tin contains, or in polythene or cellophane bags and sealed.These bags should in turn be enclosed in card board boxes.

The powder (chooranam) is said to retain its potency for two months and then gradually deteriorate .However, if properly packed and stored they keep good for a year.

The *chooranam* to facilitate easy handling and to assure exact dosage of administration, could be pressed in to tablets with the addiction of a suitable binder.These tablets could be packed in bottles or tubes made either of glass or plastics or packed in strips
of metal foil or plastic sheets.

In Industry, the tablets are made, counted and packed by electronic devices.

4. MATERIALS AND METHODS

4.1. PREPARATION OF THE DRUG

Materials:

RAJAKESARI CHOORANAM has been selected from the siddha literature''**ANUBOGA VAITHIYA BRAMMA RAGASIYAM".**

Ingredients:

1. Vaalmilagu	(piper cubeba) Linn
2. Thippili	(Piper longum) Linn
3. Perarathai	(Alpinia galanga) Wild
4. Chukku	(Zingiber officinale) Rose
5. Maasikkai	(Quercus infectoria) Olivier
6. Saathikkai	(Myristica fragrans) Houtt
7. Kasthuri	(Moschus moschiferus) Linn
8. Elam	(Eletteria cardamomum) Maton
9.Kirambu	(Syzigiyum aromaticum) Merrill & Perry
10.Lavangapattai	(Cinnamomum verum) Presl
11.Athimathuram	(Glycyrrhiza glabra) Linn

Collection of the raw Drugs and Authendication:

1) *Vaalmilagu*:

It was bought from the Gobal aasan store, Nagercoil. The raw material was identified and authenticated by PG Gunapadam department, Govt.Siddha Medical College, Palayamkottai, Tamilnadu.

2) Thippili:

It was bought from the Gobal aasan store, Nagerkovil. The raw material was identified and authenticated by PG Gunapadam department, Govt.Siddha Medical College, Palayamkottai, Tamilnadu.

3) Saathikkai:

It was bought from the Gobalaasan store, Nagercoil. The raw material was identified and authenticated by botanist and PG Gunapadam department, Govt.Siddha Medical College, Palayamkottai, Tamilnadu.

4) Chukku:

It was bought from the Gobalaan store, Nagarcoil. The raw material was identified and authenticated by botanist and PG Gunapadam department,
Govt.Siddha Medical College, Palayamkottai, Tamilnadu

***5) Perarathai*:**

It was bought from the Gobaalan store, Nagarcoil.Palayamkottai. Thrikadugu, and karunabi was taken and purification process was the raw material was identified and authenticated by botanist and PG Gunapadam department, Govt.Siddha Medical College, Palayamkottai, Tamilnadu.

***6) Kasthuri*:**

It was collected from Gobaalan store, Nagarcoil. The raw material was identified and authenticated by botanist and PG Gunapadam department, Govt.Siddha Medical College, Palayamkottai, Tamilnadu.

7) Maasikkai:

It was collected from Gobaalan store, Nagarcoil.The raw material was identified and authenticated by botanist and PG Gunapadam department, Govt.
Siddha Medical College, Palayamkottai, Tamilnadu.

:**8) Athimaduram**

It was collected from Gobaalan store, Nagarcoil.The raw material was identified and authenticated by botanist and PG Gunapadam department, Govt.
Siddha Medical College,Palayamkottai,Tamilnadu

9)Elam:

It was collected from Gobaalan store,Nagarcoil.The raw material was identified and authenticated by botanist and PG Gunapadam department, Govt. Siddha Medical College,Palayamkottai,Tamilnadu

10)Lavangapattai:

It was collected from Gobaalan store,Nagarcoil.The raw material was identified and authenticated by botanist and PG Gunapadam department, Govt.
Siddha Medical College,Palayamkottai,Tamilnadu

11)Kirambu

It was collected from Gobaalan store,Nagarcoil.The raw material was identified and authenticated by botanist and PG Gunapadam department, GovtSiddhaMedicalCollege,Palayamkottai,Tamilnadu

A.Purification

l.Athimathuram:

Wash in pure water and remove the skin and cut into small pieces and dryit.

2. Lavangapattai: Dry in the sunlight.

3. Vaalmilagu: Remove thestalk then dry in the sunlight

4. Kasthuri: Remove the hair particles

5. Sukku:

Fry the dry ginger with limestone 1:2 ratio.After 9 hours wash it and dry then remove the external skin

6. Thippili: Sock in 24minutes in kodiveli leaf juice and dry in the sunlight.

7. Yelam:Clean the dust and dry in the sunlight.

8. Maasikkai: Fry in the cow's ghee.

9. Jathikkai:Remove the outer skin and it dried with sunlight.

10. Kirambu: Remove the dust particles and dry in the sunlight.

11. Perarathai: Remove the skin and dry in the sunlight.

C.Process of preparation

Sukku, Thippili, Kirambu, Lavanga Patti, Elam, Kasthuri, Val Milagu, Athimaduram, Maasikkai, Perarathai, Saathikai are taken and powdered in Stone mortar individually and filtered to obtain a fine powder (Vasthirakayam Process) and thoroughly mixed. It is a Rajakesari Chooranam.

D.Indication: Kasam, swasam, kshayam (Respiratory disorders)

E.Dosage: 1/2 varagan (2.1gram)

F.Adjuvant : Honey, piper betle juice

G.Shelf life :3months

INGREDIENTS OF RAJAKESARI CHOORANAM

Athimathuram

Kirambu

Saathikkai

Perarathai

Kasthuri

Lavangapattai

INGREDIENTS OF RAJAKESARI CHOORANAM

Thippli

Chukku

Maasikkai

Vaal milagu

Elam

Rajakesari Chooranam

4.2. STANDARDIZATION OF THE DRUG

The identification of the drugs an authenticated by P.G.Gunapadam Department & Herbal Botany Dept. GSMC, Palayamkottai.

Standardization of drugs helps in confirming it's identify and determination of its quality and effectiveness. Standardisation of herbomineral drug is based on qualitative and quantitative analysis through physico-chemical properties and instrumental studies. Physico-chemical analysis and elemental analysis of this herbomineral formulation will be been done in Govt. Siddha medical college, Palayamkottai. IITM (FTIR in Dept of Chemistry) and SEM in Dept of mechanics, Chennai.

Organoleptic character

The organoleptic characters of the sample drug were evaluated.1gm of the test drug was taken and the colour, odour, taste, texture, particle size and other morphology were viewed by naked eye under sunlight. Then the result is noted.

4.2.1. PHYSICO CHEMICAL ANALYSIS

Physicochemical studies of the trial drug have been done according to the WHO guidelines.

Determination of Ash Values

Total Ash

3g of the test drug was accurately weighed and incinerated in a crucible dish at a temperature not exceeding 450^{o}C until it was free from carbon. It was then cooled and weighed. The % w/w of ash with reference to the air-dried powder was calculated.

Water Soluble Ash

The total ash was obtained as the above method for preparation of total ash. The ash was boiled with 25ml of water for 5mins. The insoluble ashes were collected using filter paper. It was then washed with hot water and transferred to the silica crucible. It was then ignited for 15minutes at temperature not exceeding 450^{o}C. For determination of weight of the water soluble ash the silica crucible and residue were weighed until constant weight was attained. The weight of the water soluble ash is determined by subtracting the weight of insoluble ash from the weight of total ash.

Acid insoluble Ash

The total ash was obtained as the above method for preparation of total ash. The ash was boiled for 5minutes with 25ml 10% Hcl. The insoluble ashes were collected using filter paper and washed with hot water. It was then transferred to the silica crucible and ignited for 15minutes at temperature not exceeding 450^{o}C.

The silica crucible and residue were weighed until constant weight is attained.

Determination of Extractive Value

Alcohol Soluble Extractive Value

3g of test drug powder was weighed and macerated with 100ml of ethanol in a closed container for 24 hours. The resulting solution was shaken continuously for 6 hours. It is then allowed to stand and soak for 18 hours. The solution is filtered and evaporated of the filtrate in a flat bottomed shallow dish and dried at 105^{o}C. Then the content was cooled and weighed.

Water soluble Extractive value

3g of test drug powder was weighed and macerated with chloroform and water, respectively, at 80^{o}C for 24 hrs. The resulting solution was shaken continuously for 6 hours and allowed to stand and soak for 24hrs then filtered. The solution from both chloroform and water respectively was filtered and evaporated of the filtrate in a flat bottomed shallow dish. It was dried at 105^{o}C then cooled and weighed.

Loss on Drying

The powdered drug was taken and dried in the oven at 100- 105°C to constant weight. The result was noted.

Thin-layer chromatography

Thin-layer chromatography (TLC) is a chromatographic technique that is useful for separating organic compounds. Because of the simplicity and rapidity of TLC, it is often used to monitor the progress of organic reactions and to check the purity of products.TLC is a simple, quick and inexpensive procedure that gives how many components are in a mixture.TLC is also used to support the identity of a compound in a mixture when the R_f of a compound is compared with the R_f of a known compound(preferably both run on the same TLC plate).Chromatography works on the principle that different compounds will have different solubilities and adsorbtion to the two phases between which they are to be partitioned. As the solvent rises by capillary action up through the adsorbent, differential partitioning occurs between the components of the mixture dissolved in the solvent stationary adsorbent phase. The more strongly a given component of a mixture is adsorbed on to the stationary phase, the less time it will spend in the mobile phase and the more slowly it will migrate up the plate.

4.2.2. CHEMICAL ANALYSIS

Preliminary Basic and Acidic radical studies

Preparation of the extract:

5 gms of the drug was weighed accurately and placed in to a 250 ml clean beaker.Then 50 ml of distilled water is added and dissolved well.Then it is boiled well for about 10 minutes.It is cooled and filtered in a 100ml volumetric flask and made up to 100ml with distilled water.This fluid is taken for analysis.

QUALITATIVE ANALYSIS FOR BASIC RADICALS.

Test for Calcium:

2ml of the above prepared extract is taken in a clean test tube. To this add 2ml of 4% Ammonium oxalate solution.No Formation of white precipitate.

Test for Iron (Ferric):

The extract is acidified with glacial acetic acid and potassium ferro cyanide.
No blue colour is formed.

Test for Iron (Ferrous):

The extract is treated with concentrated Nitric acid and ammonium thiocyanate solution. Formation of blue red colour.

QUALITATIVE ANALYSIS FOR ACIDIC RADICALS.

Test for Zinc:

The extract is treated with potassium ferro-cyanide.No Violet precipitate is formed.

Test for Sulphate:

2ml of extract is added to 5% barium chloride solution. Formation of white precipitate.

Test for Chloride:

The extract is treated with silver nitrate solution.No Formation of white precipitate.

Test for Phosphate:

The extract is treated with ammonium molybdate and concentrated nitric acid. No yellow precipitate.

Test for Carbonate:

The substance is treated with concentrated Hcl.No Brisk effervescence is formed

Test for Starch:

The extract is added with weak iodine solution. Formation of blue colour.

Test for Albumin:

The extract is treated with Esbach`s reagent. No yellow precipitate.

Test for Tannic acid:

The extract is treated with ferric chloride. Bluish black precipitate is formed.

Test for unsaturation:

The extract is treated with potassium permanganate solution.It gets Decolourised.

Test for the Reducing sugar:

5ml of Benedict`s qualitative solution is taken in a test tube and allowed to boil for 2 minutes and added 8-10 drops of the extract and again boil it for 2 minutes. No colour change is occurs.

Test for Amino acid:

One or two drops of the extract is placed on a filter paper and dried it well. After drying, 1% Ninhydrin is sprayed over the same and dried it well. Formation of violet colour.

4.2.3. INSTRUMENTAL ANALYSIS

Scanning Electron Microscope (SEM)

Principle:

Another important feature of the SEM is the three-dimensional appearance of the specimen image, which is a direct result of the large depth of field. The SEM is also capable of examining objects at very low magnification. This feature is useful in viewing particle size and shape of any composition at various stages of preparation in siddha system as well as other fields. The large depth of field available in the SEM makes it possible to observe 3- dimensional objects in stereo. Today, a majority of SEM facilities are equipped with X-ray analytical capabilities. Thus topographic crystallographic and compositional information can be obtained rapidly, efficiently and simultaneously from the same area.

Scanning Electron Microscope (SEM)

Figure No: 1- **Scanning Electron Microscope**

The microstructure of the powders was examined using a Hitachi S 3000H scanning electron microscope (Fig). The scanning Electron Microscope is one of the most versatile instruments available for the examination and analysis of the micro structural characteristics of solid objects. The primary reason for the SEM's usefulness is the high resolution which can be obtained when bulk objects are examined; values of the order of 5nm (50degreeA) are usually quoted for commercial instruments. Advanced

research instruments have been described which have achieved resolutions of about 2.5nm (25 degree A). Any solid material can be studied.

Sample size is limited to specimens less than about 10μm in diameter. An electron beam passing through an evacuated column is focused by electromagnetic lenses onto the specimen surface. The beam is then rastered 0ver the specimen in synchronism with the beam of a cathode ray tube display screen. In eleastically scattered secondary electrons are emitted from the sample surface and collected by a scintillator, the signal from which is used to modulate the brightness of the cathode ray tube. In this way the secondary electron emission from the sample is used to form an image on the CRT display screen. (Goldstein, et. al., 1992).

Differences in secondary emission result from changes in surface topography. If (elastically) back-scattered electrons are collected to form the image, contrast results from compositional differences. Cameras are provided to record the images on the display screen. Since an electron is a charged particle, it has a strong interaction with the specimen (due to coulomb interaction). When an electron beam images on a specimen, it is scattered by atomic layers near the surface of the specimen. As a result, the direction of electron motion changes and its energy is partially lost. Once an incident electron (primary electron) enters a substance, its direction of motion is influenced by various obstructions (multiple scattering), and follows a complicated trajectory which is far from a straight line. Also, when electrons with the same energy are incident on the specimen surface, a portion of electrons is reflected in the opposite direction (back scattered) and the remainder is absorbed by the specimen (exciting X- rays or other quanta in the process). If the specimen issufficiently thin, the electron can pass all the way through the specimen (transmitted electrons, scattered or non-scattered).

The depth at which various signals are generated due to electron beam – specimen interaction indicates the diffusion area of the signals in the specimen in addition to the local chemistry of the specimen. Secondary electrons mainly indicate information about the surface of a specimen. Since secondary electrons do not diffuse much inside the specimen, they are most suitable for observing the fine-structures of the specimen surface. That is to say, sharp scanning images with high resolution can be expected from secondary electrons, because of the smaller influence on resolution by their diffusion.

As the incident electron energy increases, the probability of incident electrons colliding with elemental components of the specimen and releasing secondary electrons

also increases. In other words, as the incident energy increases, the emission of electrons from the specimen also increases. However, as the energy increases beyond a certain level, the incident electrons penetrate deeper into the specimen with the result that the specimen derived electrons use up most of their energy to reach the specimen surface. Consequently, the electron emission yield decreases. Therefore, the peak secondary electron emission yield occurs at a specific entry level of the incident electrons.

In order to verify the existence of a substance and recognize its shape, the image contrast must be well defined. In other words, even if a system boasts extremely high resolution, if image contrast is poor, it would be extremely difficult to determine the existence of a substance, let alone recognize its shape.

Fourier Transform - Infra red Spectroscopy (FT-IR)

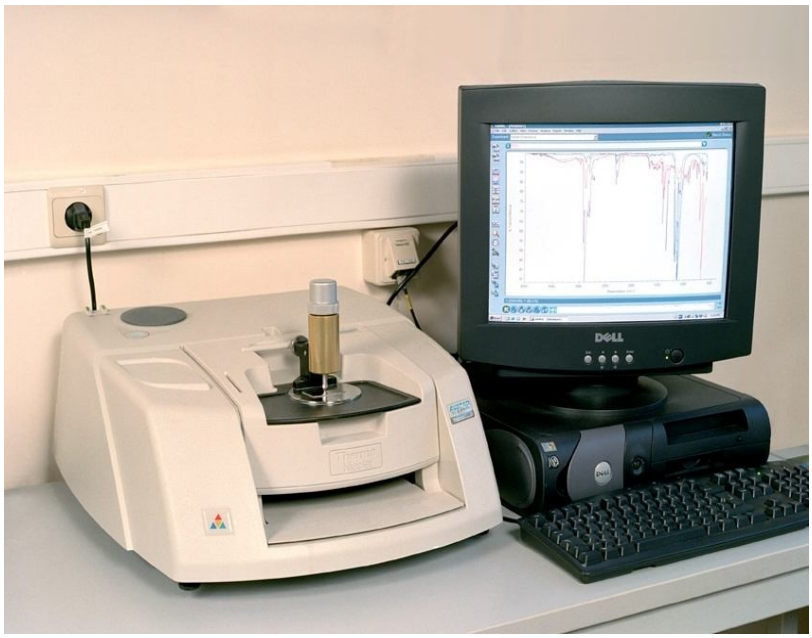


Figure No:2-FTIR Machine

Schematic diagram:

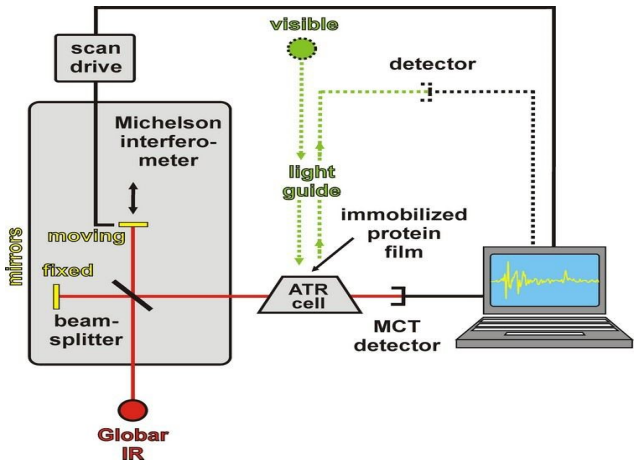


Figure No: 3- Schematic diagram

Introduction

Vibrational spectroscopy is an extremely useful tool in the elucidations of molecular structure. The spectral bands can be assigned to different vibrational modes of the molecule. The various functional groups present in the molecule can be assigned by a comparison of the spectra with characteristic functional group frequencies. As the positions of the bands are directly related to the strength of the chemical bond, a large number of investigations including intermolecular interactions, phase transitions and chemical kinetics can be carried out using this branch of spectroscopy.

In IR spectroscopy, the resonance absorption is made possible by the change in dipole moment accompanying the vibrational transition. The Infrared spectrum originates from the vibrational motion of the molecule. The vibrational frequencies are a kind of fingerprint of the compounds.

This property is used for characterization of organic, inorganic and biological compounds. The band intensities are proportional to the concentration of the compound and hence qualitative estimations are possible. The IR spectroscopy is carried out by using Fourier transform technique.

Principle

Infra red spectroscopy involves study of the interaction of electromagnetic radiation with matter. Due to this interaction, electromagnetic radiation characteristic of the interacting system may be absorbed (or emitted). The experimental data consist of the nature (frequency of wave length) and the amount (intensity) of the characteristic

radiation absorbed or emitted. These data are correlated with the molecular and electronic structure of the substance and with intra- and inter molecular interactions.

Source: Nernst Glower

Beam splitter : It is made up of a transparent material. Thin films of Silicon deposited on Potassium bromide (KBr)

Bromide (KBr) Detectors : Deutrated TriGlycine Sulphate (DTGS).

MIR Range : 4000 to 450 cm-1

Resolution : 4.0 cm-1

Sampling Techniques

There are a variety of techniques for sample preparation depending on the physical form of the sample to be analyzed.

Solid	:	KBr or Nujol mull method.
Liquid	:	Csl / TIBr Cells
Gas	:	Gas cells

KBr Method

- The sample is grounded using an agate mortar and pestle to give a very fine powder.
- The finely powder sample is then mixed with about 100mg dried KBr salt.
- The mixture is then pressed under hydraulic press using a die to yield a transparent disc and measure about 13mm diameter and 0.3mm in thickness.

Nujol Mull Method

- The sample is ground using an agate (natural quartz) mortar and pestle to give a very fine powder.
- A small amount is then mixed with nujol oil to give a paste and this paste is then applied between two sodium chloride plates.
- The plates are then placed in the instrument sample holder ready for scanning.

Liquids

- Viscous liquids can be smeared in the cell and directly measured.
- For dilute solutions, liquid cells and variable path length cells are employed.

Measurements Techniques

The procedure for recording the %T or %A is as follows:

- Air is first scanned for the reference and stored. The sample is then recorded and finally the ratio of the sample and reference data is computed to give required %T or %A at various frequencies.

- Study of substances with strong absorbance bands and weak absorbance bands aswell as possible.
- Small amount of samples are sufficient
- High resolution is obtained.

Procedure

- Preparation of samples for infrared measurements and infrared spectra Typically,1.5 mg of protein, dissolved in the buffer used for its purification, were centrifuged in a 30 K Centric on micro concentrator (Amicon) at 3000_g at 4oC until a volume of approximately 40 Al.
- Then, 300 Al of 20 mM this buffer, prepared in H_20 or $_2H0$, pH or p2H 7.2, were added and the sample concentrated again. The p2H value corresponds to the pH meter reading + 0.4. The concentration and dilution procedure was repeated several times in order to completely replace the original buffer with the Tris buffer.
- The washings took 24 h, which is the time of contact of the protein with the $2H_20$ medium prior FT-IR analysis. In the last washing, the protein was concentrated to fine a volume of approximately 40 Al and used for the infrared measurements.
- The concentrated protein sample was placed in CaF_2 windows and a 6 Am tin spaceror a 25 Am Teflon spacer for the experiments in H_20 or $2H_20$, respectively. FT-IR spectra were recorded by means of a Perkin-Elmer Spectrum-1 FT-IR spectrometer using a deuterated triglycine sulfate detector.

At least 24 h before, and during data acquisition, the spectrometer was continuously purged with dry air at a dew point of 40oC. Spectra of buffers and samples were acquired at 2 cm_1 resolution under the same scanning and temperature conditions. In the thermal denaturation experiments, the temperature was raised in 5oC steps from 20 to 95oC.

- Before spectrum acquisition, samples were maintained at the desired temperature for the time necessary for the stabilization of temperature inside the cell (6 min).Spectra were collected and processed using the SPECTRUM software from Perkin - Elmer. Correct subtraction of H_20 was judged to yield an approximately flat baseline at 1900-1400 cm_ 1, and subtraction of $2H_20$ was adjusted to the removal of the$2H_20$ bending absorption close to 1220 cm_ 1

Inductively coupled plasma optical emission spectrometry (ICP-OES),

Figure No:4- ICP-OES

Inductively coupled plasma optical emission spectrometry (ICP-OES)is an analyticaltechnique used for the detection of trace metals. It is a type of emission spectroscopy thatuses the inductively coupled plasma to produce excited atoms and ions thatemit electromagnetic radiation at wavelengths characteristic of a particular element. Theintensity of this emission is indicative of the concentration of the element within the sample.

Mechanism

The ICP-OES is composed of two parts: the ICP and the optical spectrometer. TheICP torch consists of 3 concentric quartz glass tubes. The output or "work" coil of the radiofrequency (RF) generator surrounds part of this quartz torch. Argon gas is typically usedto create the plasma.

When the torch is turned on, an intense electromagnetic field is created within thecoil by the high power radio frequency signal flowing in the coil. This RF signal is createdby the RF generator which is, effectively, a high power radio transmitter driving the "workcoil" the same way a typical radio transmitter drives a transmitting antenna. The argon gasflowing through the torch is ignited with a Tesla unit that creates a brief discharge arcthrough the argon flow to initiate the ionization process. Once the plasma is "ignited", theTesla unit is turned off.

The argon gas is ionized in the intense electromagnetic field and flows in a particularrotationally symmetrical pattern towards the magnetic field of the RF coil. A

stable, hightemperature plasma of about 7000 K is then generated as the result of the inelastic collisionscreated between the neutral argon atoms and the charged particles. A peristalticpump delivers an aqueous or organic sample into a nebulizer where it is changed into mistand introduced directly inside the plasma flame. The sample immediately collides with theelectrons and charged ions in the plasma and is itself broken down into charged ions. Thevarious molecules break up into their respective atoms which then lose electrons andrecombine repeatedly in the plasma, giving off radiation at the characteristic wavelengths ofthe elements involved.

Within the optical chamber(s), after the light is separated into its differentwavelengths (colors), the light intensity is measured with a photomultiplier tube or tubesphysically positioned to "view" the specific wavelength(s) for each element line involved, or, in more modern units, the separated colors fall upon an array of semiconductor photodetectors such as charge coupled devices (CCDs). In units using these detector arrays, theintensities of all wavelengths (within the system's range) can be measured simultaneously, allowing the instrument to analyze for every element to which the unit is sensitive all atonce. Thus, samples can be analyzed very quickly.

The intensity of each line is then compared to previously measured intensities of known concentrations of the elements, and their concentrations are then computed by Interpolation along the calibration lines. In addition, special software generally corrects for interferences caused by the presence of different elements within a given sample matrix.Examples of the application of ICP-OES include the determination of metals, arsenicpresent in Traditional medicines, and trace elements bound to proteins. ICP-OES is widelyused in minerals processing to provide the data on grades of various streams, for theconstruction of mass balances.

The author used ICP-OES for elemental identification and quantitative compositional information of the **RAJAKESARI *CHOORANAM*.**

4.3.TOXICOLOGICAL ANALYSIS

4.3.1.ACUTE TOXICITY STUDY IN FEMALE WISTER RATS TO EVALUATE TOXICITY PROFILE OF *RAJAKESARI CHOORANAM*

OBJECTIVES

The aim of this Study is to evaluate the toxicity of the test substance ***RAJAKESARI CHOORANAM***, when administered orally to Female Wister Ratswith different doses, so as to provide a rational base for the evaluation of the toxicological risk to man and indicate potential target organs.

Guidelines followed:

(a) OECD Guidelines No. 423,

Study Design and Controls:

1) Female Wister Ratsin controlled age and body weight were selected

2) ***RAJAKESARI CHOORANAM*** was administered at **5 mg/kg,50 mg/kg,300 mg/kg,1000 mg/kg, and 2000 mg/kg** body weight as (Water) as suspension along with blank.

3) The results were recorded on day 0, with single oral dosing period of 14 days.

EXPERIMENTAL PROCEDURE

1. ANIMALS

1.1. Supply

A total of 15 Female Wister Rats with an approximate age of 6 weeks and purchased from M/s.Venkateshwara Enterprises Pvt. Ltd, Bangalore. On their arrival a sample of animals was chosen at random and weighed to ensure compliance with the age requested. The mean weights of Female Wister Rats were 100-150 g respectively. The animals were housed in metabolic cages (55 x 32.7 x 19 cm), with sawdust litter, in such a way that each cage contained a maximum of 3 animals of the same sex.

All animals underwent a period of 20 days of observation and acclimatization between the date of arrival and the start of treatment. During the course of this period, the animals were inspected by a veterinary surgeon to ensure that they fulfilled the health requirements necessary for initiation of the Study.

1.3. Housing

The Female Wister Rats were housed in metabolic cages (55 x 32.7 x 19 cm), placed on racks. From the week before initiation of the treatment, each cage contained a maximum of 6 mice of the same sex and treatment group.

Each cage was identified by a card, color coded according to the dose level. This card stated the cage number, number and sex of the animals it contained, Study number, test substance code, administration route, dose level and Study Director's name, date of the arrival of the aanimals and initiation of treatment.

The temperature and relative humidity were continuously monitored. Lighting was controlled to supply 12 hours of light (7:00 to 19:00 hours) and 12 hours of dark for each 24-hour period.

The cages corresponding to each experimental group were distributed on racks in such a manner that external factors, such as environmental conditions, were balanced as far as possible.

2. DIET

All the rats had free access to a pelleted rat diet. The diet was analyzed by the manufacturer to check its composition and to detect possible contaminants.

2.1. Water

The water was offered ad libitum in bottles.

3. ADMINISTRATION ROUTE AND PROCEDURE

The test substance was administered orally. The Female Wister Rats belonging to the control group were treated with the vehicle (Water) at the same administration volume as the rest of the treatment groups.

3.1 Numbering and Identification

The animals were marked on body with picric acid solution prepared in water. The marking within the cage was as below.

Group No	**Animal Marking**
1	**Head**
2	**Body**
3	**Tail**

Table-2 Numbering and Identification

The group no., cage no., sex of the animal and animal no. were identified as indicated below using cage label and body marking on the animals

Cage No	Group No	Animal Marking	Sex
1	I	H,B,T	Female
2	II	H,B,T	Female
3	III	H,B,T	Female
4	IV	H,B,T	Female
5	V	H,B,T	Female

Table-3 Numbering and Identification

3.2 Doses

The doses for the study were selected based on literature search and range finding study. Following the period of fasting, the animals wereweighed and then drug was administered orally as single dose using a needle fitted onto a disposable syringe of approximate size at the following different doses.

GROUP	DOSE
GROUP	DOSE
Group-I	5 mg/kg
Group-II	50 mg/kg
Group-III	300 mg/kg
Group-IV	1000 mg/kg
Group-V	2000 mg/kg

Table-4 Doses

The test item was administered as single dose. After single dose administration period, all animals were observed for day 14.

Dose Preparation

RAJAKESARI CHOORANAM was added in distilled water and completely dissolved to form oral for administration. The dose was prepared of a required concentration before dosing by dissolving, in distilled water. It was mixed well. The preparation for different doses was vary in concentrations to allow a constant dosage volume.

3.3 Administration

The test item was administered orally to each Female Wister rats as single dose using a needle fitted onto a disposable syringe of appropriate size at the following different doses. The concentration was adjusted according to its body weight. The volume was not exceeding 10 ml/kg bodyweight. Variability in test volume was minimized by adjusting the concentration to ensure a constant volume at all dose levels.

3.4 Observation period

All animals were observed for any abnormal clinical signs and behavioral changes. The appearance, change and disappearance of these clinical signs, if any, were recorded for approximately 1.0, 3.0 and 4.0 hours post-dose on day of dosing and once daily thereafter for14 days. Animals in pain or showing severe signs of distress were humanely killed. The cageside observation was included changes in skin, fur, eyes and mucous membranes, occurrence of secretions and excretions. Autonomic activity like lacrimation, piloerection, pupil size and unusual respiratory pattern, changes in gait, posture, response to handling, presence of clonic or tonic movements, stereotypes like excessive grooming and repetitive circling or bizarre behavior like self-mutilation, walking backwards etc were observed. At the 14th day, sensory reactivity to stimuli of different types (e.g. auditory, visual and proprioceptive stimuli) was conducted. Auditory stimuli responses were measured by clicker sound from approximately 30 cm to the rats; visual stimuli response were measured with the help of shining pen light in the eye of rats and placing a blunt object near to the eye of rats. Response to proprioceptive stimuli was measured by placing anterior/dorsal surface of animals paw to the table edge. The responses of reactions for these three exercises were normal in animals belonging to both the controls as well as drug treatment dose groups.

4 Mortality and Morbidity

All animals were observed daily once for mortality and morbidity at approximately 1.0, 3.0 and 4.0 hours post dose on day of dosing and twicedaily (morning and afternoon) thereafter for 14 days.

4.3.2 Sub-Acute Toxicity Study inWister rats to Evaluate Toxicity Profile of RAJAKESARI CHOORANAM

1. Objective

The objective of this '**Sub-Acute Toxicity Study of RAJAKESARI CHOORANAM ON Wister Rats**' was toassess the toxicological profile of the test item when treated as a single dose. Animals should be observed for 28 days after the drug administration. This study provides information on the possible health hazards likely to arise from exposure over a relatively limited period of time.

2. Test Guideline Followed

OECD407Method- Sub-Acute Toxic Class Method (Repeated Dose 28-Day Oral Toxicity Study in Rodents)

3. Test Item Detail

Name: **RAJAKESARI CHOORANAM**

4. Test System Detail

The study was conducted on 5 male 5 female Wister rats. These animals were selected becauseofthe recommendedrodent species for oral studies as per followed guideline and availability of Animals 8-12 weeks old male and female rats were selected afterphysical and behavioral examination.The body weight range was fallen within ± 20% of the mean body weight at the time ofRandomization and grouping. The rats were housed in standard laboratory condition inPolypropylene cages, provided with food and water *adlibitum*in the Animal at M/s. SreeVenkateshwaraEnterprises Pvt. Ltd, Bangalore. The experimental protocol was approved by Institutional AnimalEthical Committee as per the guidance of Committee for thePurpose of Control and Supervision ofExperiments on Animals (CPCSEA), Ministry of Environment and Forest, government of India.

5. Acclimatization

The animals were selected after veterinary examination by the veterinarian. All the selectedanimals were kept under acclimatization for a week.

6. Randomization & grouping

One day before the initiation of treatment (days 0- last day of acclimatization), the selectedanimals were randomly grouped into three different groups containing minimum 6 maleanimals per group.

7. Numbering and Identification

The animals were marked on body with picric acid solution prepared in water. The markingwithin the cage was as below.

Group No	Animal Marking
1. CONTROL	**H,B,T,HB,NM (MALE)** **H,B,T,HB,NM (FEMALE)**
2. LOW DOSEOF RAJAKESARI CHOORANAM 300mg/kg.	**H,B,T,HB,NM (MALE)** **H,B,T,HB,NM (FEMALE)**
3. MIDDLEDOSE OFRAJAKESARI CHOORANAM 600mg/kg.	**H,B,T,HB,NM (MALE)** **H,B,T,HB,NM (FEMALE)**
4. HIGH DOSEOF RAJAKESARI CHOORANAM 900mg/kg.	**H,B,T,HB,NM (MALE)** **H,B,T,HB,NM (FEMALE)**

Table-5 Numbering and Identification

The group no., cage no., sex of the animal and animal no. were identified as indicated below using cage label and body marking on the animals:

Cage No	Group No	Animal Marking	Sex
1	**1. CONTROL**	**H,B,T,HB,NM** **H,B,T,HB,NM**	**Male** **Female**
2	**2. LOW DOSEOF RAJAKESARI CHOORANAM 300mg/kg.**	**H,B,T,HB,NM** **H,B,T,HB,NM**	**Male** **Female**
3	**3. MIDDLEDOSE OFRAJAKESARI CHOORANAM 600mg/kg.**	**H,B,T,HB,NM** **H,B,T,HB,NM**	**Male** **Female**
4	**4. HIGH DOSEOF RAJAKESARI CHOORANAM 900mg/kg.**	**H,B,T,HB,NM** **H,B,T,HB,NM**	**Male** **Female**

Table-6 Animal Marking

8. Husbandry

8.1 Housing

The Wister rats were housed in standard polypropylene cages with stainless steel top grill. Paddyhusk wasused as bedding. The paddy husk was changed at least twice in a week.From the week before initiation of the treatment, each cage contained a maximum of 6 mice of the same sex and treatment group.

8.2 Environmental conditions

The animals were kept in a clean environment with 12 hour light and 12 hour dark cycles.The air was conditioned at 22±3^{0}C and the relative humidity was maintained between 30-70% with 100% exhaust facility. The cages corresponding to each experimental group were distributed onracks in such a manner that external factors, such as environmental conditions, were balanced as far as possible.

8.3 Feed & feeding schedule

'SaiDurgaAnimal Feed, Bangalore.Feed was provided *adlibitumthroughout* the study period, except overnight fasting(18-20hours) prior to dose administration. After the substance has been administered, food was withheld for a further 3-4 hours.

8.4 Water

The water was offered *adlibitum* in bottles. There was periodically analyzed to detect the presence of possible contaminants

8.5 Doses

The doses for the study were selectedbased on literature search and range finding study.Following the period offasting, the animals were weighed and then extract wasadministered orally as single dose usinga needle fitted onto a disposable syringe ofapproximate size at the following different doses.

TEST GROUP	**DOSE TO ANIMALS (mg/kg body-weight/day)**	**NUMBER OFANIMALS**
Group-1	**1. CONTROL**	10 (5MALE and5 FEMALE)
Group-II	**2. LOW DOSEOF RAJAKESARI CHOORANAM 300mg/kg.**	10(5MALE and 5 FEMALE)
Group-III	**3. MIDDLEDOSE OFRAJAKESARI CHOORANAM 600mg/kg.**	10(5MALE and 5 FEMALE)
Group-IV	**4. HIGH DOSEOF RAJAKESARI CHOORANAM 900mg/kg.**	10(5MALE and 5 FEMALE)

Table -7 Dose Level

The test item was administered as single dose. After single dose administration period, all animals were observed for 28 days.

Dose Preparation

RAJAKESARI CHOORANAM was added in distilled water and completely dissolved to for oral foradministration. The dose was prepared of a required concentration before dosing bydissolving **RAJAKESARI CHOORANAM** in distilled water. Itwas mixed well. The preparation for differentdoses was vary in concentrations to allow a constant dosage volume.

8.6 Administration

The test item was administered orally to each rat as single dose using a needlefitted onto adisposable syringe of appropriate size at the following different doses. The concentration wasadjusted according to its body weight. The volume was not exceeding 10 ml/kg bodyweight. Variability in test volume was minimized by adjusting the concentration to ensure aconstant volume at all dose levels.

9. OBSERVATIONS

These observations were also performed on week-ends. The observations included but were not limited to changes in skin and fur, in the eyes and mucous membranes, in the respiratory, circulatory, central nervous and autonomous systems, somatomotor activity and behavior.

9.1. Clinical signs of toxicity

All the rats were observed at least twice daily with the purpose of recording any symptoms of ill-health or behavioral changes. Clinical signs of toxicity daily for 28 days.

9.2. Food intake

Prior to the beginning of treatment, and daily, the food intake of each cage was recorded for period of 28 days and the mean weekly intake per rats was calculated.

9.3. Water intake

Water intake was checked by visual observation during the Study. In addition, the water consumption in each cage was measured daily for a period of 28 days.

9.4 Bodyweight:

The body weight of each rat was recorded one week before the start of treatment, and duringthe course of the treatment on the day of initial, 3rd, 7th, 10th, 14th, 17th, 20th, 24th and 28th days (day of sacrifice). The mean weights for the different groups and sexes were calculated from the individual weights.

Blood Collection

Blood was collected through retro-orbital sinus from all the animals of different groups on 28th day. The blood was collected in tubes containing Heparin/EDTA as an anticoagulant. Animals were fasted over nightprior to the blood collection.

LABORATORY STUDIES

During the 4th week of treatment, samples of bloodwere withdrawn from the orbital sinus of 6 males from each group, underlight etheranesthesia after fasting for 16 hours. The blood samples are used to evaluate Hematological parameters like RBC, WBC, and PLATELETS etc…..Thecollectedblood samples also centrifuged 10000 rpm in 10 minutes to separate the serum. The separated serum used to evaluate biochemical parameters like SGOT, SGPT, ALP and BILIRUBIN etc.,

Hematology

The following hematological parameters were analysed using Autoanalyser

Hb : Haemoglobin (g %)

PCV : Packed Cell Volume

WBC : White Blood Corpuscles (x103/cmm)

RBC : Red Blood Corpuscles (x106/cmm)

Blood Platelet count (x103/cmm)

Differential WBC count:

N : Neutrophils (%)

L : Lymphocytes (%)

M : Monocytes (%)

E : Eosinophils (%)

RDW : Red Cell Distribution Width.

MPV : Mean Platelet Volume

Clinical Biochemistry:

The following clinical Bioparameters were analysed using Autoanalyser

Total serum protein (g/dl)

ALT/SGPT : Alanine aminotransferase (U/L)

AST/SGOT : Aspartate aminotransferase (U/L)

ALP : Alkaline serum phosphatase (U/L)

CHL : Cholesterol (mg/dL)

HDL : High density lipoprotein

TG : Triglyceride

TERMINAL STUDIES

Sacrifice and macroscopic examination

On completion of the 4 weeks of treatment, 18 Wister rats were sacrificed by ether inhalation. A full autopsy was performed on all animals which included examination of the external surface of the body, all orifices, cranial, thoracic and abdominal cavities and their contents both *in situ* and after evisceration. As the number of animals exceeded the number that could be sacrificed in one day, the autopsies were carried out over three consecutive days at the end of the treatment period.

Organ weights:

After the macroscopic examination the following organs were weighed after separating the superficial fat: Brain, Heart, Spleen Kidneys, Testes, Liver, Lungs, pancreas and stomach.

HISTOPATHOLOGICAL STUDIES

Anatomy of the liver was studied immediately after sacrificing the animals. A small portion was fixed in 10% neutral buffered formalin as described by Luna 14 . Thin sections of 4-55 µm were taken, stained with Haematoxylin and Eosin and histology was studied[7]

Luna, LG. Manual of histology, staining methods of Armed Forces Institute of Pathology. 3 rdEdn., New York, McGraw Hill, 1968

4.4. PHARMACOLOGICAL STUDY

4.4.1.EFFECT OF *RAJAKESARI CHOORANAM* ON BRONCHO-ALVEOLAR LEVAGE IN MICE

PROCEDURE

Albino mice of either sex were divided into six groups containing five animals each (n=5).All animals were sensitized by an intraperitonial injection of 1ml alum precipitate antigen containing 20µg of ova albumin and 8mg of alum suspended in 0.9% of sodium chloride solution. A booster injection of this alum-albumin mixture was administered 7 days later. Non sensitized animal were injected with alum only (GroupII). Seven days after (15 days) the second injection, animal was exposed to aerosolized oval albumin (1%) for 30 min. Animals belonging to groups I received orally on distilled waterand Group IV, V, VI received orally on RC 0.226mg, 1.134mg and 56.7mg. Animals of group III, as positive control group received dexamethasone (0.27mg/kg p.o.) 5 hr before antigen challenge. The mice were sacrificed at the end of study (24hr after sensitization) and trachea catheter was inserted in trachea. Bronchoalveolar lavage fluid (BALF) was collected by lavaging the lung with two aliquots 5ml of 0.9% of sodium chloride solution. Total recovery volume per mice was approximately 5ml. Total leukocyte Eosinophils and Neutrophils were counted under microscope and histopathologic evaluation of lung tissue was carried out. [1]

1. Connett G. J., Warde C., Wooler E.And Lenney W. Arch Dis Childhood 1994; 70: 170- 173

DOSAGE SCHEDULE:

The required dose for mice/rat will be calculated by using the standard dose calculation procedure from recommended clinical dose.

CONVERSION FORMULA:

Human dose is 2100mg,BD

Total clinical dose (a) x conversion factor (b) 0.018 = (c) per 200 gm of rat

2100 mg x 2(a) x 0.018 (b) = 37.8 (c) /30gms of MICE

37.8/1000X30 = 1.134mg/kg

S.No	Groups	Dose /kg, weight	Dose /200 gms. weight	Volume of administration
1	Vehicle Control	--	--	0.5 ml
2	Therapeutic Dose	1.134mg	0.226mg	0.5 ml
3	Average Dose	5.67mg	1.134mg	0.5 ml
4	High Dose	11.34mg	56.7mg	0.5 ml

Table - 8 Experimental Doses Calculated as per the standard procedures

EXPERIMENTAL DESIGN

GROUP 1: CONTROL (Normal Saline)

GROUP 2: ONLY ALUM

GROUP 3: ONLY ALUM + Dexamethazone

GROUP 4: ONLY ALUM + R.C 0.226mg/kg

GROUP 5: ONLY ALUM + R.C 1.134 mg/kg

GROUP 6: ONLY ALUM + R.C 56.7 mg/kg

4.4.2. IN-VITRO ANTISPASMODIC ACTIVITY OF RAJAKESARICHOORANAM ON EXCISED RAT ILEUM

ISOLATION OF RAT ILEUM:-

Rats were anesthetized and sacrificed by cervical displacement followed by exsanguinations. The ileum was dissected out, immersed in Tyrode'ssolutionand cleaned off the mesentery. Respective segments of 2-3cm long were mounted in a 25ml tissue organ bath, filled with a mixture of 95% O2 and 5% CO2 and maintained at 37 o C. The composition of Tyrode's solution (in mM for l lit) was 9 mg KCl, 0.1 mg NaCl, 0.1mg NaHCO3, 0.42mg NaH2PO4, 0.6 mg Glucose and pH value was 7.4.

ANTI-SPASMODIC ACTIVITY ASSAY PROCEDURE:-

1. Firstly concentration dependent responses of acetylcholine were recorded (with dose of 0.1ml, 0.2ml, 0.4ml, 0.8ml, 1.6ml, 3.2ml) using Sherrington's recording drum with a frontal writing lever. Contact time of 60 sec, and base line of 30sec time cycle were opted for proper recording of the responses in presence of plane Tyrode's solution as stock-I solution.

2. Then same concentration dependent responses of acetylcholine (Ach) using same procedure for a mixture of Tyrode's solution+ Lantana camara extract (with a concentration of 1mg/ml) as a stock-II solution were recorded.

3. Lastly the same concentration dependent responses of Ach for a mixture of Tyrode's solution+ Atropine (as a standard antispasmodic agent) as a stock-III solution were recorded.

4.4.3. ANTIHISTAMINIC AND ANTIANAPHYLACTIC ACTIVITY OF SIDDHA FORMULATION OF RAJAKESARI CHOORANAM

Introduction

Allergy is one of the common diseases that affect mankind with diverse manifestations. The prevalence of allergy and asthma has risen in the recent years despite an improvement in the general health of the population.[1] Allergic diseases are responsible for significant morbidity and have severe economic impact.[2] Various epidemiological studies have identified the causes for an increase in the prevalence of upper and lower respiratory tract allergic diseases. Some of the postulated reasons are increasing environmental pollution [3] and increased predisposition of individuals producing excessive Ig_E through a major change in the gene pool, changing lifestyles, and an increasing awareness of the disorders.[4] Intensive research during the last several decades has highlighted the role of lymphocytes, immunoglobulins, mast cells, and various autacoids in the etiopathogenesis of allergic conditions. Inspite of the voluminous literature on the subject, the treatment of allergic diseases continues to be far from satisfactory. The available treatment options for upper and lower respiratory tract allergic diseases have major limitations owing to low efficacy, associated adverse events, and compliance issues.[5]

AYUSH, an Indian system of medicine, has described several drugs from indigenous plant sources for use in the treatment of bronchial asthma and allergic disorders. In the present study, the effects of Siddha formulation of rajakesari chooranam were studied on the active anaphylaxis and mast cell stabilization in rats, and histamine-induced bronchospasm in guinea pigs.

Materials and Methods

Animals

Inbred Wistar rats (175–200 g) and guinea pigs (400–600g) of either sex housed in standard conditions (temperature22 ± 2° C, relative humidity 60 ± 5% and 12 h light/dark cycle) were used. They were fed with standard pellet diet and water ad libitum. The Institutional Animal Ethics Committee approved the experimental protocol. Histamine and horse serum were procured from Sigma Chemicals and toluidine blue from Loba-Chemie, Mumbai. Elisa kit for Ig_E was supplied by Orion diagnostics, Espoc, Finland. All other chemicals and reagents were procured from Hi-Media Laboratories limited, Mumbai.

Mast cell stabilizing activity

Treatment protocol

Twenty-four rats were divided into four groups of six animals in each group.

Group I served as control and received vehicle (water).

Group II (sensitized control group)

GroupIII served as the treatment control, which was treated with rajakesari chooranam at a dose of 200mg/kg body weight, in oral route.

Group IV served as the treatment control, which was treated with rajakesari chooranam

at a dose of 400 mg/kg body weight, in oral route.

In group11 to group 1V were sensitized by injecting 0.5 ml of horse serum subcutaneously along with 0.5 ml of triple antigen containing 20,000 million Bordetella pertussis organisms (Serum Institute of India Ltd.,Pune), Once a day for 14 days.

On day 14, the rats were sacrificed 2 h after the treatment and the intestinal mesentry was taken out for the study on mast cells. Mesentries along with intestinal pieces were excised and kept in Ringer Locke solution (NaCl 154, KCl 5.6, CaCl2 2.2, NaHCO3 6.0, glucose 5.55 mM/L of distilled water) at 37oC. The mesenteric pieces were challenged with 5% horse serum for 10 min after which the mast cells were stained with 1.0% toluidine blue and examined microscopically for the number of intact and degranulated mast cells.[6]

Histamine-induced bronchospasm in guinea pigs

Bronchospasm was induced in guinea pigs by exposing them to 1% histamine aerosol under constant pressure (1 kg/cm2) in an aerosol chamber (24 × 14 × 24 cm) made of perplex

Glass,of the three groups of six animals each.

Group I served as control.

GroupII served as the treatment control, which was treated with rajakesari chooranam

at a dose of 200 mg/kg body weight, in oral route.

Group III served as the treatment control, which was treated with rajakesari chooranam

at a dose of 400 mg/kg body weight, in oral route.

The animals were exposed to 1% histamine aerosol under constant pressure (1 kg/cm2) in an aerosol chamber on day 0 without any treatment. The end

point,preconvulsive dyspnea (PCD) was determined from the time of aerosol exposure to the onset of dyspnea leading to the appearance of convulsions.[7] As soon as PCD commenced, the animals were removed from the chamber and exposed to fresh air. This PCD was taken as day 0 value. On days 1 and 5, 2 h after the administration of the drug, the time for the onset of PCD was recorded as on day 0.

4.4.4ANTI-INFLAMMATORY ACTIVITYOF SIDDHA PREPARATION RAJAKESARI CHOORANAM

The anti-inflammatory activities of siddha preparation rajakesari chooranamat a dose of 200 and 400mg/kg were evaluated using carrageenan-induced paw edema method. The inflammation was readily produced in the form of edema with the help of irritant such as carrageenan. Carrageenan is a sulphated polysaccharide obtained from sea weed (Rhodophyceae) and when injected cause the release of prostaglandins by the way it produces inflammation and edema.

REQUIREMENTS:

Animal : Albino rat (180-200 g)

Drugs and chemicals : Carrageenan (1%w/v), Diclofenac sodium (standard),

Carboxy methyl cellulose (1%w/v),

Digital plethysmo meter. U G O Basile (Italy)

Test compounds : siddha preparation rajakesarichooranam

METHOD:

Anti-inflammatory activity was performed by the following procedure of Bhandri et al(1)The animals were divided into 4 groups each having six animals. A freshly prepared suspension of carrageenan (1% w/v , 0.1 ml) was injected to the planter region of left hind paw of each rat. One group was kept as control and the animals of the other groups were pretreated with the siddha formulation rajakesari chooranamtest Compounds dissolved with 2 ml sterile water given through orally 30 min before the carrageenan treatment. The paw volumes of the test compounds, standard and control groups were measured at 60,240,360 minutes of carrageenan treatment with the help of Digital plethysmometer (Ugo basile, Italy). Mean increase in paw volume was measured and the percentage of inhibition was calculated.

% Anti-inflammatory activity = (Vc-Vt / Vc) x 100

Where, ***Vt***-mean increase in paw volume in rats treated with test compounds,

Vc-mean increase in paw volume in control group of rats.

4.5. ANTI MICROBIAL ACTIVITIES BY WELL DIFFUSION METHOD

Aim:

The antimicrobial activity of *Rajakesari chooranam* was adapted through Well diffusion method(Agar diffusion testing).

PRINCIPLE

The antimicrobials present in the plant extract are allowed to diffuse out into the medium and interact in a plate freshly seeded with the test organisms. The resulting zones of inhibition will be uniformly circular as there will be a confluent lawn of growth. The diameter of zone of inhibition can be measured in millimeters.

Components of Muller Hinton agar medium:

Beef extract - 2gm/lit
Acid Hydrolysate of Casein - 17.5 gm/lit
Starch - 1.5 gm/lit
Agar – 17gm/lit
Distilled water - 1000 ml
PH - 7.3± 0.1 at 25^0C

PROCEDURE (Murray *et al.*, 1995)

Petriplates containing 20ml Muller Hinton medium were seeded with 24hr culture of bacterial strains. Wells were cut and 20 µl of the plant extracts (aqueous) were added. The plates were then incubated at 37°C for 24 hours. The antibacterial activity was assayed by measuring the diameter of the inhibition zone formed around the well (NCCLS, 1993). Streptomycin was used as a positive control. standard for an In-vitro antimicrobial activity of *Rajakesari Chooranam* was screened against bacteria strains such as *Klebsiella pneumonia, Streptococcus mutans, Staphylococcus aureus, Escherichia coli, Pseudomonas.aerugina, Enterococcus faecalis.*

Murray PR, Baron EJ, Pfaller MA, Tenover FC, Yolken HR Manual of Clinical Microbiology, 6th Ed. ASM Press, Washington DC, 1995; 15-18.

5. RESULTS AND DISCUSSION

STANDARDIZATION OF THE TEST DRUG

Standardisation of the drug is more essential to derive the efficacy, potency of the drug by analysing it by various studies. Following are the results of physicochemical and. Physical characterisation and estimation of basic and acidic radicals have been done and tabulated.

Toxicological results of the drug and pharmacological activity of the drug were derived. Its result has been tabulated and interpretation was made below. Thus it is to give a complete justification to bring the effectiveness of the trial drug *Rajakesari Chooranam.*

ORGANOLEPTIC CHARACTER

The following characters have been noted in *Rajakesari Chooranam.*

S.No.	Organoleptic characters	Result
1	Appearance	Powder
2	Touch	Nice
3	Smell	Pleasant odour
4	Taste	Bitter,Pungent
5	Diethel ether	NA
6	Colour in day light	Brown

Table -9 organoleptic characters

Interpretation:

The organoleptic characters of the drug *Rajakesari Chooranam* showed that the colour of the chooranam is Brown in colour since prepared from dry herbs and minerals, Bitter, Pungent in taste which might be responsible for the activity mentioned earlier and on sight they are fine powder.

- The fineness of the *chooranam* represents easy absorption and better availability of the drugs.
- The size of the particle is reduced through various stages like pounding, sieving, filtering through white cloth (*vasthirakaayam*).

- ❖ Only if the size of the particle is reduced to micro and nano particles, the drug is easily assimilable in the digestive system.
- ❖ The above processes reduced the size of the particle so that the *chooranam* passes through the sieve.

Table S.NO	Parameter	Result
1	Loss on drying	8.5%
2	Ash content	5.8%
3	Acid insoluble ash	0.8%
4	Water sol.matter	18.4%
5	Alcohol sol.matter	22.1%
Micro bial limit test		
6.	Microbial contamination Total Viable aerobic count Total Enterobacteriaceae Total fungal count	$1.6x10^4$ coll g Nil Nil
7.	Test for specific Pathogen E.coli Salamonella spp. S.aureus Pseudomonas aeruginosa	Nill

Table - 10 Physico chemical standards and Micro bial limit test

INTERPRETATION

Total Ash:

Total ash value of plant material indicated the amount of minerals and earthy materials present in the plant material. The total inorganic content (ammonium, potassium, calcium, chloride, iron, etc.,) present in the drug is measured through the Total ash value and it is of 5.8 % for RC.

Acid Insoluble Ash:

The acid insoluble ash value of the drug denotes the amount of siliceous matter present in the plant. The quality of the drug is better if the acid insoluble value is low. It is 0.8% for RC.

Water Soluble Ash:

Water-soluble ash is the part of the total ash content, which is soluble in water. It is 18.4% for RC

Alcohol Soluble Ash:

Alcohol-soluble ash is the part of the total ash content, which is soluble in alcohol. It is 22.1% for RC

- These are indicating the approximate measure of chemical constituents of crude drug.
- The percentage of soluble matters present in the drug is determined by the values of water extractive and ethanol extractive.
- Based on the extractive value suitable solvent can be selected. It also gives the percentage of drug which will correlate with the metabolism reactions.
- Water-soluble extractive value plays an important role in evaluation of crude drugs
- The alcohol-soluble extractive value was also indicative for the same purpose as the water-soluble extractive value

Loss on drying :

- The total of volatile content and moisture present in the drug was established in loss on drying.
- Moisture content of the drug reveals the stability and its shelf-life.
- High moisture content can adversely affect the active ingredient of the drug.

Thus low moisture content could get maximum stability and better shelf life

Microbial Limit Tests

The total bacterial count and the total fungal count of the drug were found to be within the WHO prescribed limits which indicate that the drug is free from microbial condamination. The other pathogens like Escherichia coli, Salmonella sps, Pseudomonoas aeruginosa and Staphylococcus aureus were found to be completely absent in the drugs.

TLC Result

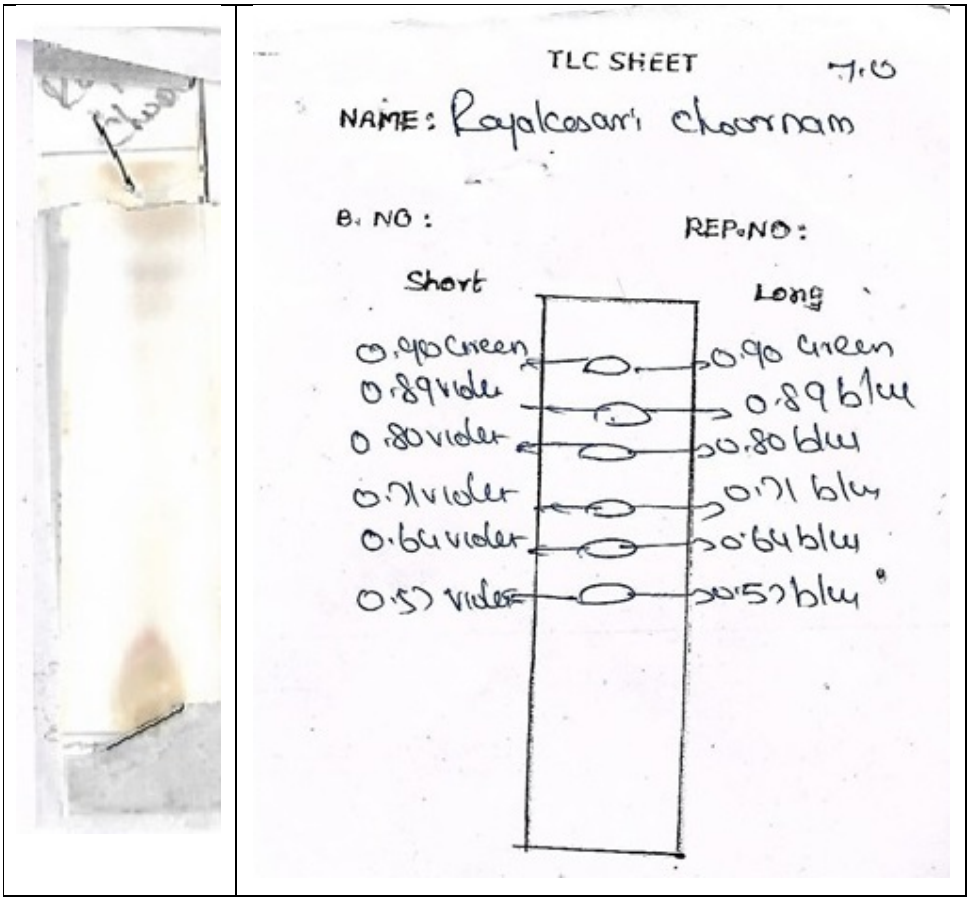


Figure No:5 TLC Result

INTER PRETATION TLC principle requiring shorter time and better resolution. The plates are similar to conventional TLC plates.

Under UV 254 nm and 366 nm test related to alkaloids, it shows major spots short at Rf 0.90 (Green), 0.89, 0.80,0.71,0.64,0.57 (Violet), and long at Rf 0.90(Green),0.89,0.80,0.71,0.64,0.57(blue). TLC of *RC* various Rf values was observed. The variation of Rf values indicated the presence of alkaloids, phenols, tannin and some unknown compounds in this drug.

CHEMICAL ANALYSIS:

Priliminary test for acidic and basic radicles:

EXPERIMENT	**INFERENCE**
Test for Calcium:	Absent
Test for Sulphate:	**Present**
Test for Chloride:	Absent
Test For Carbonate:	Absent
Test for Starch:	**present**
Test for Iron Ferric:	Absent.
Test for Iron Ferrous:	**Present**
Test for Phosphate:	Absent
Test for Albumin:	Absent.
Test for Tannic acid:	**Present**
Test for Unsaturation:	**present**
Test for the Reducing sugar:	Absent
Test for the Amino acid:	**present**
Test for Zinc:	Absent

Table No: 11 Chemical analysis result

The bio-chemical analysis of *Rajakesari chooranam* contains the following chemical constituents FerrousIron, Sulphate, Starch, Unsaturated compounds, Amino acids, Tannic acid.

INTERPRETATION

Iron is an essential constituent of Hemoglobin, cytochromes and other components of respiratory enzyme systems like cytochrome oxidase, catalase, and peroxidase. It enhances the arterial oxygen level. The drug enhances oxygen supply and promotes the normal ventilation of the lungs and reduces the dyspnoea. It participate the cellular oxidation mechanism.

Unsaturated fats

monounsaturated and polyunsaturated fats can replace saturated fat in the diet, trans unsaturated fats should not. Replacing saturated fats with unsaturated fats helps to lower levels of total cholesterol and LDL cholesterol in the blood.

Starch

Digestive enzymes have problems digesting crystalline structures. Raw starch will digest poorly in the duodenum and small intestine, while bacterial degradation will take place mainly in the colon.

Amino acids act as neurotransmitters and some act as starting materials for the biosynthesis of neurotransmitters, hormones and other important biochemical compounds.Amino acids contribute to various anti-oxidant and immunological activities relevant to asthma pathogenesis, raising the possibility that differences in amino acids may be involved in asthma aetiology.

Sulphate has been considered as an adjunct therapy for severe and lifethreatening asthma exacerbation.

Tannins

Helps in healing of wounds and inflammation of mucous membrane.

They restore the Anti-Oxidant status of the organs to almost normal levels.

Increases the cellular Anti-Oxidant enzymes

INSTRUMENTAL ANALYSIS RESULTS

SEM Results:

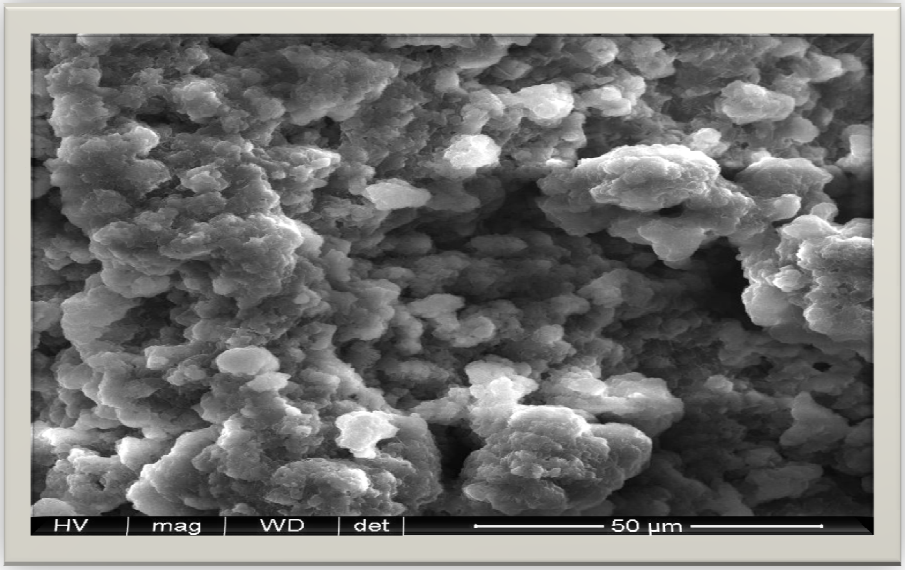


Fig No: 6-SEM Picture 650 magnification

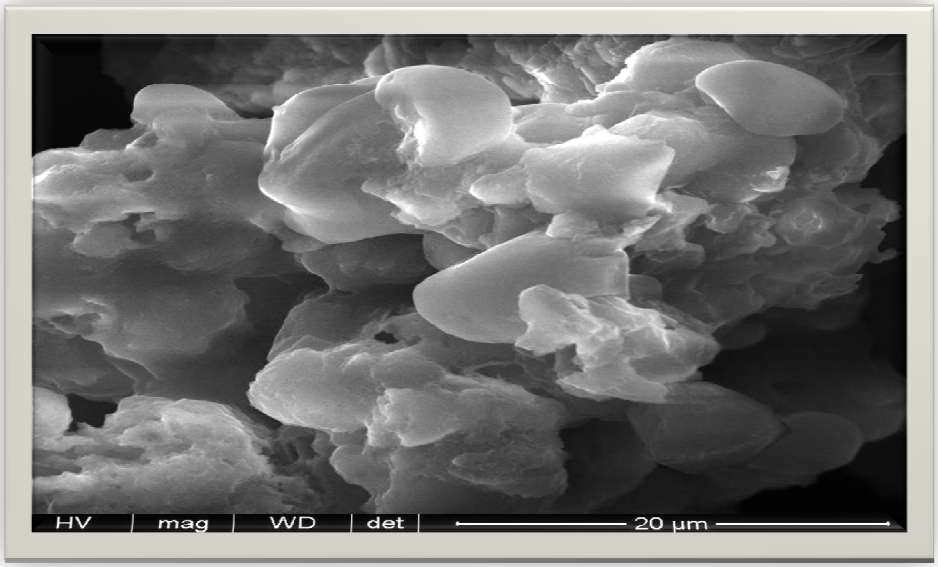


Fig No: 9-SEM Picture 430 magnification

INTERPRETATION: SEM analysis of the *RAJAKESARI CHOORANAM* shows most of the Particles present in the sample is micron size, average particle size is 1 to 5 microns. So, very minimal quantity of the medicine is enough to treat the disease.The morphology of the *Rajakesari Chooranam* sample can be determined by Environmental SEM (FEI Quanta). A representative portion of each sample must be sprinkled onto a double side carbon tape and mounted on aluminium stubs, in order to get a higher quality secondary electron image for SEM examination. We have observed from SEM photographs that particles are elongated in shapes and sizes are in the range from 1 microns to 5 microns.Although the particle sizes of different batches showed similarity, it seems that these particles are aggregates of much smaller particles. When dispersed in an aqueous medium, these preparations form a negatively charged hydrophobic particle suspension. This hydrophobicity gives these particles a tendency to aggregate together to form larger particles. *Rajakesari Chooranam* exhibited larger sizes and agglomeration of the particles. Therefore, the comparatively larger size may be due to the agglomeration of the particles by repeated cycles of grinding involved in preparation.

ICP-OES RESULTS OF *RAJAKESARI CHOORANAM*

(wt:0.42115g)

Elements	**Wave Length (nm)**	**Concentration**
Al	396.152	**BDL**
As	188.979	**BDL**
Ca	315.807	22.160 mg/L
Cd	228.802	**BDL**
Cu	327.393	BDL
Fe	238.204	05.346 mg/L
Hg	253.652	**BDL**
K	766.491	13.801 mg/L
Mg	285.213	01.324 mg/L
Na	589.592	34.390 mg/L
Ni	231.604	**BDL**
Pb	220.353	**BDL**
P	213.617	106.341 mg/L
S	180.731	01.324 mg/L
Zn	206.200	03.258 mg/L

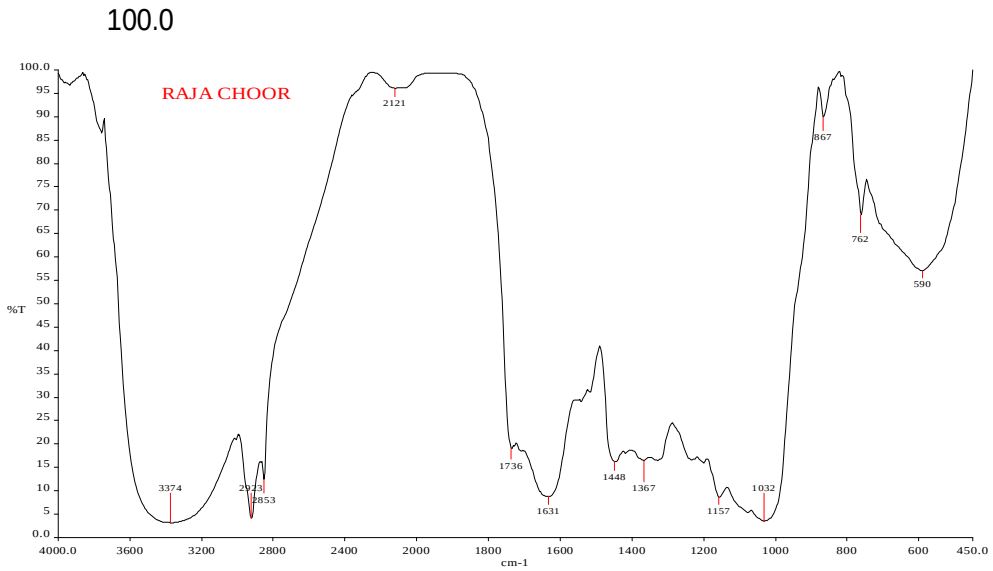
Table:12 ICP - OES Result

INTERPRETATION:

Emission spectrometry is based on the principle that atoms or ions in an excited state tend, to revert back to the ground state and in so doing emit characteristic wavelength and intensity of that light is proportional to the concentration of that particular element in the sample solution.

- This technique is used for quantitative and qualitative determination of the metals and mettaloids, in the herbo mimeral preparation.
- This results shows Below detection limit(BDL) of As(arsenic) ,Hg(Mercury), Cd (Cadmium), Pb(Lead), Ni(Nikkal), Al(Aluminum), Cu (Copper).It is evident that the effectiveness of siddha medicine has been proved by the modern scientific way.
- This result indicates the presence of Iron, Phosphorus, Potassium, Magnesium, Sodium, Calcium, Zinc, and Sulphate.
- In the presence of Magnesium and Sulfate (MgSo 4). - Magnesium sulphate has been considered as an adjunct therapy for severe and life threatening asthma exacerbation. Theoretically, Magnesium can induce bronchial smooth muscle relaxation in a dose dependent manner.
- By inhibiting calcium influx into cytosol, histamine release from mast cell, acetylcholine relase from cholinergic nerve endings.It also may increase the bronchodilator effect of beta2-agonist by increasing the receptor affinity.
- Sodium and Potassium: In the presence of Sodium and Potassium regulate the acid-base balance of the body fluids.They regulate the water balance by maintaining the osmotic pressure of the body fluids.They help to preserve the neuromuscular irritability by maintaining a state of equilibrium on account of their relative proportion in the ECF and ICF.
- In the presence of Phosphorus, It is an important constituents of phosphate buffers in the blood and urine.It is required for the formation of certain physiologically important phosphorus containing compounds like phospholipids, coenzymes and enzymes of intermediary metabolism.
- Zinc is essential for growth.There are conflicting reports about the effect of zinc supplements on asthma.Zinc are required for optimal activity of the immune system and it has been shown that low levels of these trace elements are important factors in acute and chronic inflammatory status such as bronchial asthma.
- Iron supplementation resulted in a significant decreases in airway eosinophilia, while systemic iron injections lead to a significant suppression of both allergen-induced airway eosinophilia and hyperactivity compared to placebo.

FTIR RESULT



cm-1

Figure No: 8-FTIR Result

FTIR RESULTS OF *RAJAKESARI CHOORANAM*

S.NO	Frequency,cm-1	Bond	Functional group
1	3374 (m)	N-H Stretch	Primary, Secondary, Amines, Amides
2	2923 (m)	C-H Stretch	Alkenes
3	2853 (m)	C-H Stretch	Alkenes
4	2121 (w)	C (Triple bond) N Stretch	Nitriles
5	1736(s)	C= O Stretch	Esters, Saturated aliphatic
6	1631 (m)	N-H bend	Primary amines
7	1448 (m)	C-C Stretch (in -ring)	Aromatics
8	1367 (m)	C-H bend	Alkanes
9	1157 (m)	C-H wag (-CH2X)	Alkyl halides
10	1032 (m)	C-N Stretch	Aliphatic amines
11	867 (s)	C-H “ oop”	Aromatics
12	762 (m)	C-CI Stretch	Alkyl halides
13	590 (m)	C-Br Stretch	Alkyl halides

Table No: 13 FTIR Result

M=Medium, W= Week, S = Strong

INTER PRETATION

In FTIR the wavenumbers between 4000cm^{-1}-400cm^{-1} is known as functional group area. <400cm^{-1} wave number is known as finger print area. The corresponding absorbtion frequency by FTIR shows the presence of Alcohol, Alkanes, Amines, Aromatics, Ester, Aliphatic amines, Alkyne. The O-H stretch may be due to the presence of moisture content. Infrared bonds for inorganic materials appear in the lower wave numbers than those observed for organic materials. In cofirms that Rajakesarii chooranam contains Alkanes, Amines, Aromatics, Aliphatic, Nitriles, Primary, Secondary, Amides, and Saturated aliphatic, Ester, Alky halides, Alkenes.

AMINES:

The bronchodilator effects of a number of sympathomatic amines were assessed in terms of reduction of histamine-induced bronchospasm.

AROMATICS:

The aromatics type of studies may produce valuable information to biochemists and pharmacologists in screening of individual species and their phyto-constituents to acclelerate the drug discovery and development process for the treatment of asthma.

Alkyl Halides:

These are group of compounds derived from alkanes containing one or more halogens. Some are used as anesthetics and antiseptic agents. Some of them are used in medicine for the elimination of hook worms

TOXICOLOGICAL STUDIES RESULTS:

ACUTE TOXICITY STUDIES:

EVALUATION OF ACUTE TOXICITY OF *RAJAKESARI CHOORANAM*

Effect of Acute Toxicity (14 Days) of *RAJAKESARI CHOORANAM*

Group no.	Dose(mg/kg	Observation sign	No. of animal affected.
Group-I	5mg/kg	Normal	0 of 3
Group- II	50mg/kg	Normal	0 of 3
Group-III	300mg/kg	Normal	0 of 3
Group-IV	1000mg/kg	Normal	0 of 3
Group-V	2000mg/kg	Normal	0 of 3

Table –14 Physical and behavioral examinations.

Functional and Behavioural observation	Observation	5mg/kg Group (G-I)	50mg/kg (G-II)	300mg/kg (G-III)	1000mg/kg (G-IV)	2000mg/kg (G-V)
		Female n=3	Female n=3	Female n=3	Female n=3	Female n=3
Body position	Normal	3	3	3	3	3
Respiration	Normal	3	3	3	3	3
Clonic involuntary Movement	Normal	3	3	3	3	3
Tonic involuntary Movement	Normal	3	3	3	3	3
Palpebral closure	Normal	3	3	3	3	3
Approach response	Normal	3	3	3	3	3
Touch response	Normal	3	3	3	3	3
Pinna reflex	Normal	3	3	3	3	3
Pinna reflex	Normal	3	3	3	3	3
Tail pinch response	Normal	3	3	3	3	3

Table-15 Home cage activity

Functional and Behavioral observation	Observation	Control	5 mg/ kg (G-I)	50 mg/kg (G-II)	300mg/kg (G-III)	1000mg/kg (G-IV)	2000mg/kg (G-V)
		Female n=3	Female n=3	Female n=3	Female n=3	Female n=3	Female n=3
Reactivity	Normal	3	3	3	3	3	3
Handling	Normal	3	3	3	3	3	3
Palpebral closure	Normal	3	3	3	3	3	3
Lacrimation	Normal	3	3	3	3	3	3
Salivation	Normal	3	3	3	3	3	3
Piloerection	Normal	3	3	3	3	3	3
Pupillary reflex	Normal	3	3	3	3	3	3
Abdominal tone	Normal	3	3	3	3	3	3
Limb tone	Normal	3	3	3	3	3	3

Table-16 Hand held observation

Group no	Dose no(mg/kg)	Mortality
Group-I	5(mg/kg)	0 of 3
Group-II	50(mg/kg)	0 of 3
Group-III	300(mg/kg)	0 of 3
Group-IV	1000(mg/kg)	0 of 3
Group-V	2000(mg/kg)	0 of 3

Table-17 Mortality

RESULTS

From acute toxicity study it was observed that the administration of ***RAJAKESARI CHOORANAM*** at a dose of 2000mg/kg, to a rats. From acute toxicity study it was observed that the administration of ***RAJAKESARI CHOORANAM*** at a dose of 2000 mg/kg to the rats do not produce drug-related toxicity and mortality. So No-Observed-Adverse-Effect- Level (NOAEL) of ***RAJAKESARI CHOORANAM*** is 2000 mg/kg.

DISCUSSION

RAJAKESARI CHOORANAM was administered single time at the dose of 5mg/kg, 50mg/kg , 300mg/kg, 1000mg/kg and 2000mg/kg to rats and observed for consecutive 14 days after administration. Doses were selected based on the pilot study and literature review. All animals were observed daily once for any abnormal clinical signs. Weekly body weight and food consumption were recorded. No mortality was observed during the entire period of the study. Data obtained in this study indicated no significance physical and behavioural signs of any toxicity due to administration of ***RAJAKESARI CHOORANAM*** at the doses of 5mg/kg, 50mg/kg , 300mg/kg, 1000mg/kg and 2000mg/kg to rats.

At the 14th day, all animals were observed for functional and behavioral examination. In functional and behavioral examination, home cage activity, hand held activity were observed. Home cage activities like Body position, Respiration, Clonic involuntary movement, Tonic involuntary movement, Palpebral closure, Approach response, Touch response, Pinna reflex, Sound responses, Tail pinch response were observed. Handheld activities like Reactivity, Handling, Palpebral closure, Lacrimation, Salivation, Piloercetion, Papillary reflex, abdominaltone, Limb tone were observed. Functional and behavioral examination was normal in all treated groups.Food consumption of all treated animals was found normal as compared to normalgroup.

Body weight at weekly interval was measured to find out the effect of ***RAJAKESARI CHOORANAM*** on the growth rate. Body weight change in drug treated animals was found normal.

INTERPRETATION

The study shows that Rajakesari Chooranam did not produced any toxic effect of dose of 5mg /kg, 50mg/kg, 300mg/kg, 1000mg/kg, 2000mg/kg to rats. So No-observed - Adverse- Effects - level (NOAEL) of Rajakesari Chooranam is 2000mg/kg.

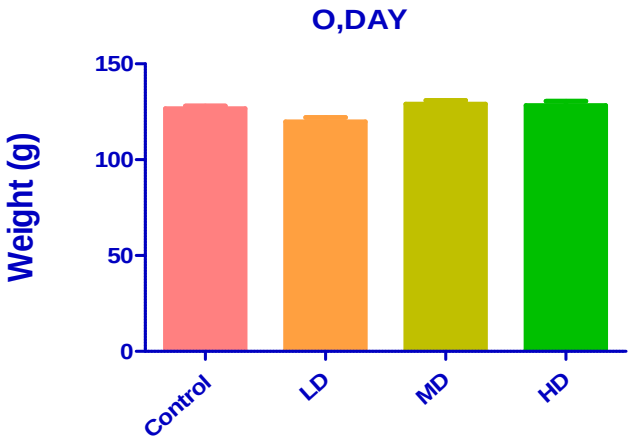
SUB ACUTE TOXICITY STUDY RESULT

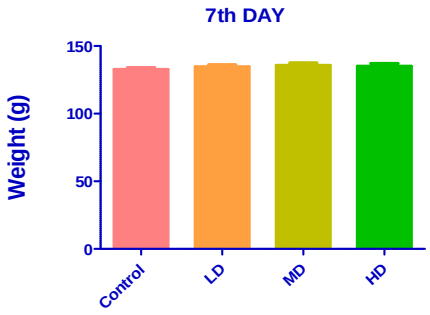
Effect Of Sub- Acute Dose(28 Days)Of RAJAKESARI CHOORANAM On Body Weight In gram

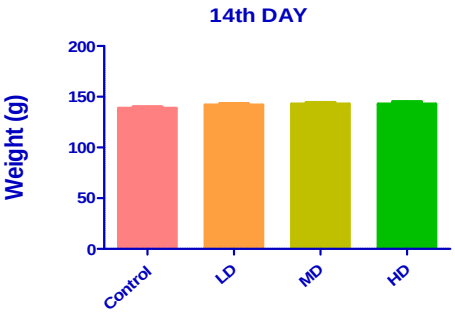
GROUP	CONTROL	R C. 300mg/kg	R C.600mg/kg	R C 900mg/kg
0,DAY	126.7±1.43	119.8±2.197	129±1.983	128.3±2.275
7th DAY	132.7±1.43	134.7±1.43	135.7±1.783	135±2.113
14th DAY	138.5±1.408	141.8±1.302	142.7±1.52	142.8±2.056
21st DAY	147.3±2.124	148.7±1.174	150.2±1.905	149±1.571
28th DAY	153.3±1.085	156.2±1.4	156.7±1.202	157±2.049

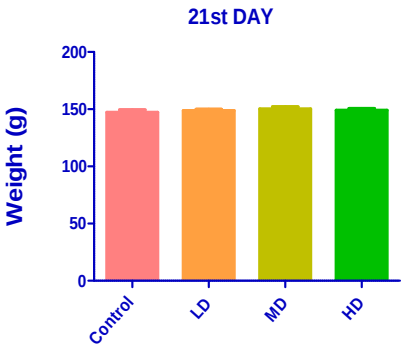
Table No. 18 Effect Of Sub- Acute Dose(28 Days)Of RAJAKESARI CHOORANAM On Body Weight In gram

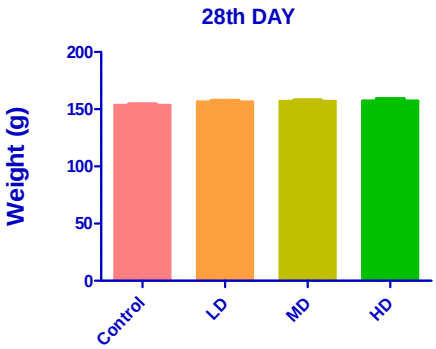
Values arae expressed as mean ± SEM Statisticalsignificance (p) calculated by one way ANOVA followed by dunnett's(n=6); $^{ns}p>0.05$, *p<0.05, **p<0.01, ***p<0.001, calculated by comparing treated groupswith control group.




7th DAY
Weight (g)
150
100
50
0
Control
LD
MD
HD


14th DAY
Weight (g)
200
150
100
50
0
Control
LD
MD
HD


21st DAY
Weight (g)
200
150
100
50
0
Control
LD
MD
HD

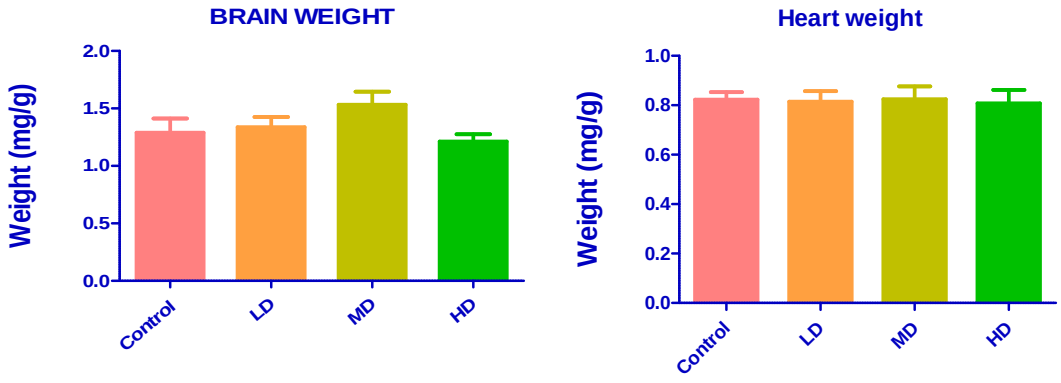

28th DAY
Weight (g)
200
150
100
50
0
Control
LD
MD
HD

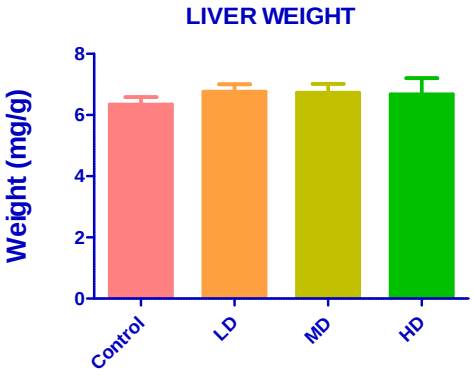
Effect Of Sub- Acute Dose(28 Days)Of RAJAKESARI CHOORANAM On Organ Weight (physical parameter) in gram

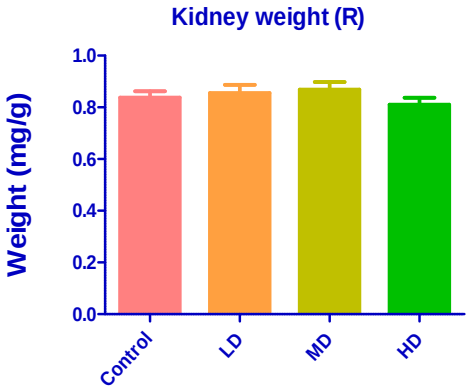
GROUP		CONTROL	R C. 300mg/kg	R C.600mg/kg	R C 900mg/kg
BRAIN		1.289±0.1234	1.337±0.08963	1.532±0.114	1.212±0.06309
HEART		0.823±0.02989	0.8145±0.04234	0.8245±0.0515	0.808±0.05421
LIVER		6.345±0.2363	6.764±0.2393	6.733±0.281	6.678±0.5239
LUNGS		1.355±0.1081	1.088±0.1403	1.25±0.1554	1.202±0.1145
KIDNEY	L	0.8382±0.02416	0.8557±0.03146	0.8683±0.02933	0.8102±0.02697
	R	0.8147±0.02458	0.8428±0.02684	0.8273±0.04038	0.8157±0.03272
TESTIS		2.914±0.1975	2.826±0.1422	2.727±0.1444	2.913±0.202
UTERUS		0.981±0.0877	1.043±0.0886	1.018±0.1147	1.09±0.06846

Table No. 19 Effect Of Sub- Acute Dose(28 Days)Of RAJAKESARI CHOORANAM On Organ Weight (physical parameter) in gram

Values arae expressed as mean ± SEM Statisticalsignificance (p) calculated by one way ANOVA followed by dunnett's(n=6); $^{ns}p>0.05$, *p<0.05, **p<0.01, ***p<0.001, calculated by comparing treated groupswith control group.




LIVER WEIGHT
Weight (mg/g)
8
6
4
2
0
Control
LD
MD
HD


Kidney weight (R)
Weight (mg/g)
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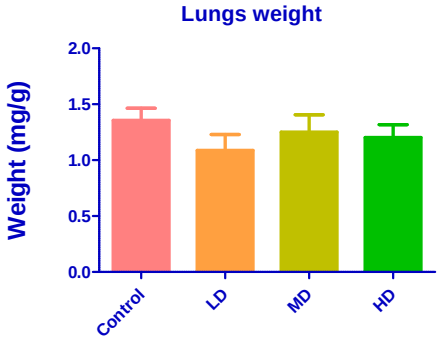
0.8
0.6
0.4
0.2
0.0
Control
LD
MD
HD


Lungs weight
Weight (mg/g)
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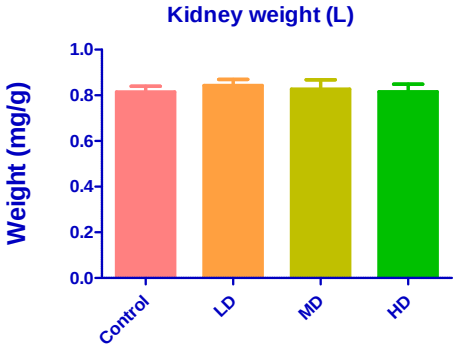
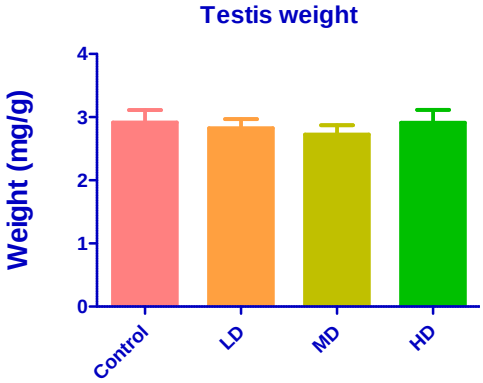
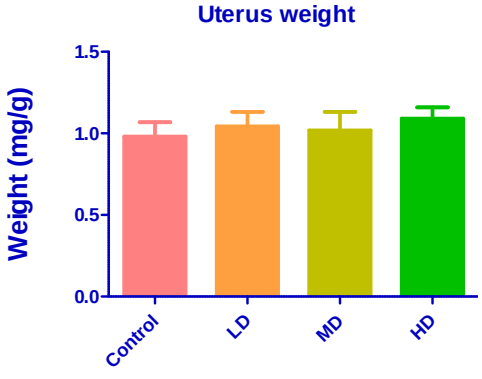
1.5
1.0
0.5
0.0
Control
LD
MD
HD


Kidney weight (L)
Weight (mg/g)
1.0
0.8
0.6
0.4
0.2
0.0
Control
LD
MD
HD


Testis weight
Weight (mg/g)
4
3
2
1
0
Control
LD
MD
HD

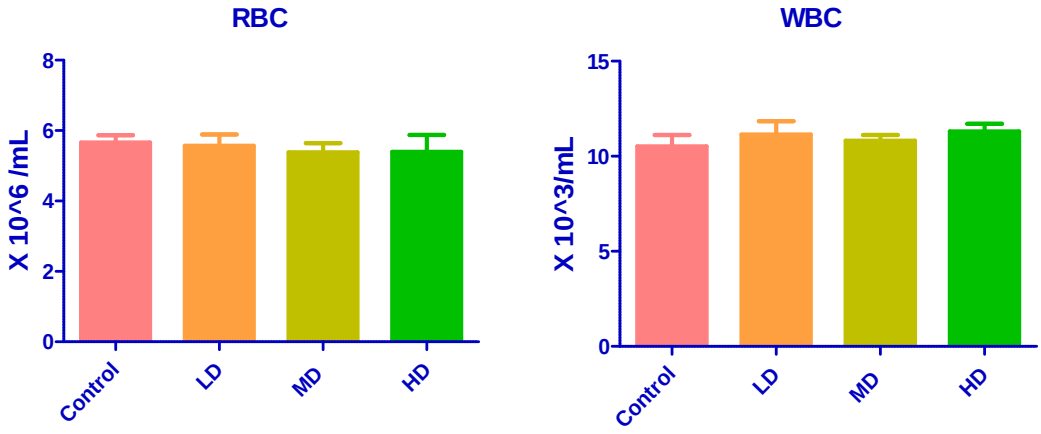

Uterus weight
Weight (mg/g)
1.5
1.0
0.5
0.0
Control
LD
MD
HD

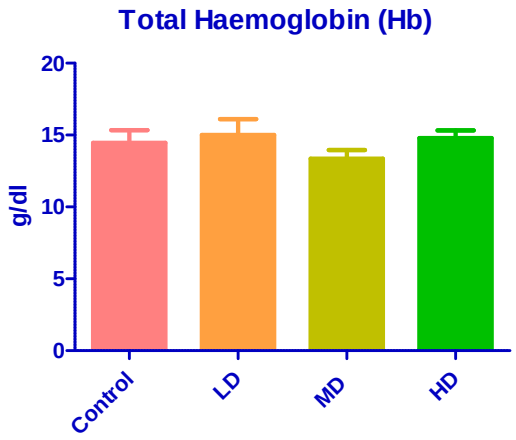
Effect Of Sub- Acute Dose(28 Days)Of RAJAKESARI CHOORANAM On Haematological Parameters.

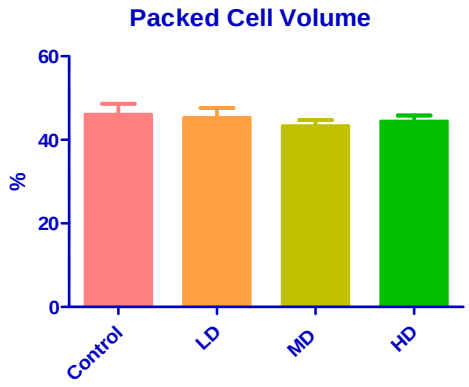
GROUP	CONTROL	R C. 300mg/kg	R C.600mg/kg	R C 900mg/kg
RBC (X10^6/µL)	5.667±0.201	5.568±0.3231	5.385±0.2607	5.393±0.4832
WBC(X10^3/µL)	10.52±0.5986	11.15±0.6893	10.82±0.3049	11.3±0.4017
HB (g/dl)	14.47±0.88	15.02±1.097	13.35±0.6109	14.78±0.54
PCV %	46±2.603	45.22±2.395	43.25±1.457	44.38±1.441
POLYMORPHS (%)	6±0.8165	6.167±1.078	4±1.095	6±0.6831
LYMPHOCYTES (%)	82.67±1.453	81±1.528	84±1.633	83.17±1.327
MONOCYTES (%)	3±0.3651	2.833±0.4773	3.167±0.6009	2.833±0.7032
EOSINOPHILS (%)	4.167±0.7032	4.667±0.4216	4.667±0.8433	4.833±0.4773

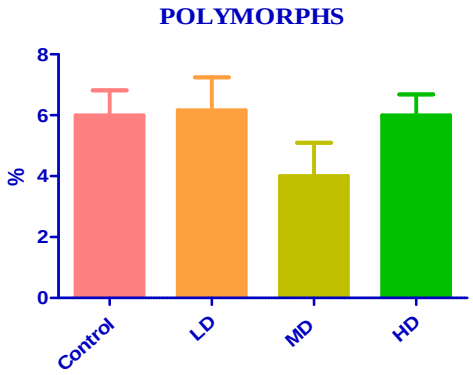
Table 20. Effect Of Sub- Acute Dose(28 Days)Of RAJAKESARI CHOORANAM On Haematological Parameters.

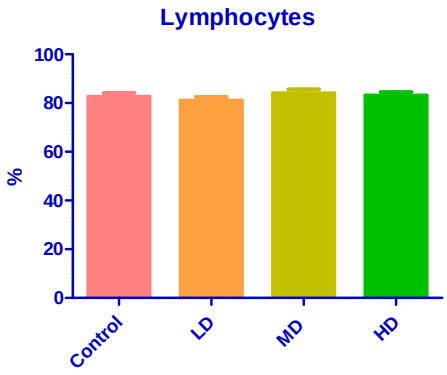
Values arae expressed as mean ± SEM Statisticalsignificance (p) calculated by one way ANOVA followed by dunnett's(n=6); $^{ns}p>0.05$, *p<0.05, **p<0.01, ***p<0.001, calculated by comparing treated groupswith control group.

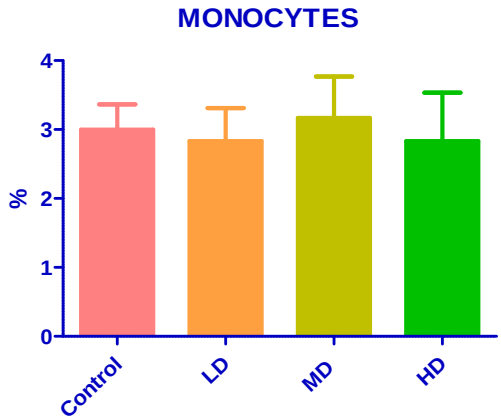


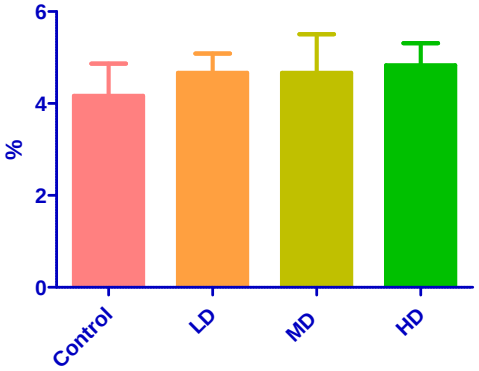

Total Haemoglobin (Hb)
g/dl
20
15
10
5
0
Control
LD
MD
HD


Packed Cell Volume
%
60
40
20
0
Control
LD
MD
HD


POLYMORPHS
%
8
6
4
2
0
Control
LD
MD
HD


Lymphocytes
%
100
80
60
40
20
0
Control
LD
MD
HD


MONOCYTES
%
4
3
2
1
0
Control
LD
MD
HD

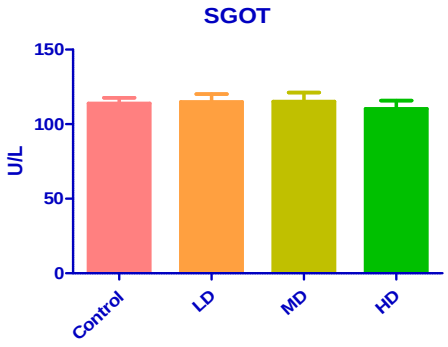

EOSINOPHILS
%
6
4
2
0
Control
LD
MD
HD

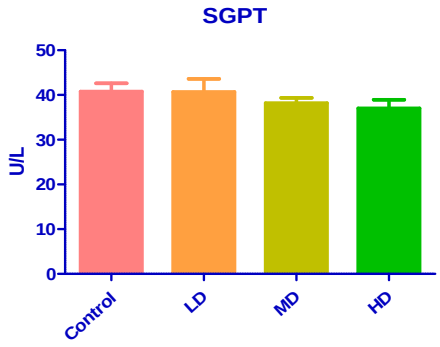
GROUP	CONTROL	R C. 300mg/kg	R C.600mg/kg	R C 900mg/kg
SGOT(units/min/liter/mg protein)	113.9±3.8	114.9±5.297	115.2±6.013	110.3±5.544
SGPT (units/min/liter/mg protein)	40.75±1.875	40.68±2.912	38.18±1.176	37±1.934
ALP (units/min/liter/mg protein)	121.5±6.745	124±3.061	121.3±6.018	123.3±2.53

Effect Of Sub- Acute Dose(28 Days)Of RAJAKESARI CHOORANAM On Biochemical Parameters

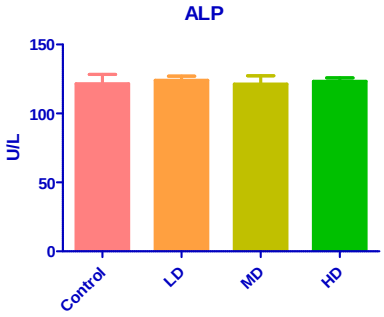
Table No. 21 Effect Of Sub- Acute Dose (28 Days)Of **RAJAKESARI CHOORANAM** On Biochemical Parameters.

Values are expressed as mean ± SEM Statisticalsignificance (p) calculated by one way ANOVA followed by dunnett's(n=6); $^{ns}p>0.05$, *p<0.05, **p<0.01, ***p<0.001, calculated by comparing treated groupswith control group.





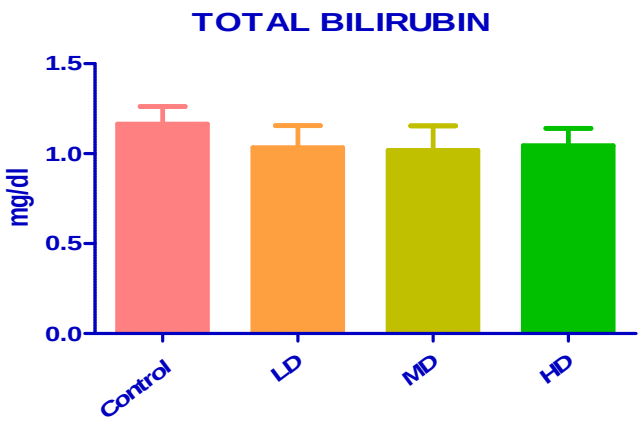
GROUP	CONTROL	R C. 300mg/kg	R C.600mg/kg	R C 900mg/kg
TOTAL BILIRUBIN (mg/dl)	1.165±0.09646	1.033±0.1222	1.018±0.1358	1.045±0.09542



Effect Of Sub- Acute Dose(28 Days)Of RAJAKESARI CHOORANAM On Biochemical Parameters.

Table 22 Effect Of Sub- Acute Dose(28 Days)Of RAJAKESARI CHOORANAM On Biochemical Parameters.

Values arae expressed as mean ± SEM Statisticalsignificance (p) calculated by one way ANOVA followed by dunnett's(n=6); $^{ns}p>0.05$, *p<0.05, **p<0.01, ***p<0.001, calculated by comparing treated groupswith control group.



GROUP	CONTROL	R C. 300mg/kg	R C.600mg/kg	R C 900mg/kg
CREATINNE (mg/dl)	27.35± 2.11	27.18± 2.678	25.43±1.857	24.65±1.092
URIC ACID (mg/dl)	1.728±0.1619	1.505±0.1174	1.663±0.2308	1.608±0.1452

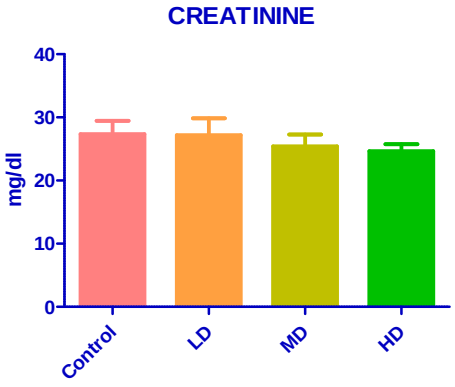
Table No. 22 Effect Of Sub- Acute Dose(28 Days)Of RAJAKESARI CHOORANAM On Biochemical Parameters.

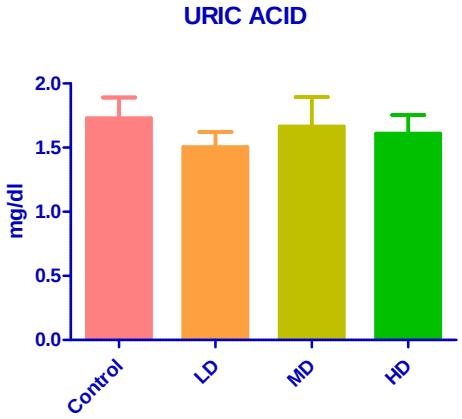
Effect Of Sub- Acute Dose (28 Days) Of RAJAKESARI CHOORANAM On Biochemical Parameters.

Table 23 Effect Of Sub- Acute Dose (28 Days) Of RAJAKESARI CHOORANAM On Biochemical Parameters

Values arae expressed as mean ± SEM Statisticalsignificance (p) calculated by one way ANOVA followed by dunnett's(n=6); $^{ns}p>0.05$, *p<0.05, **p<0.01, ***p<0.001, calculated by comparing treated groupswith control group.

GROUP	CONTROL	R C. 300mg/kg	R C.600mg/kg	R C 900mg/kg
1st DAY	34±1.461	37.83±1.376	36.67±1.585	34.67±1.145
7th DAY	40.17±0.7923	40.33±1.687	36.5±2.187	38.83±1.973
14th DAY	36.83±1.641	40.33±2.108	37.67±2.028	37.5±1.875
21st DAY	39±0.8944	40±1.932	39±1.125	38.83±2.007
28th DAY	39.67±1.333	38.67±1.022	38.17±1.682	40.67±1.022

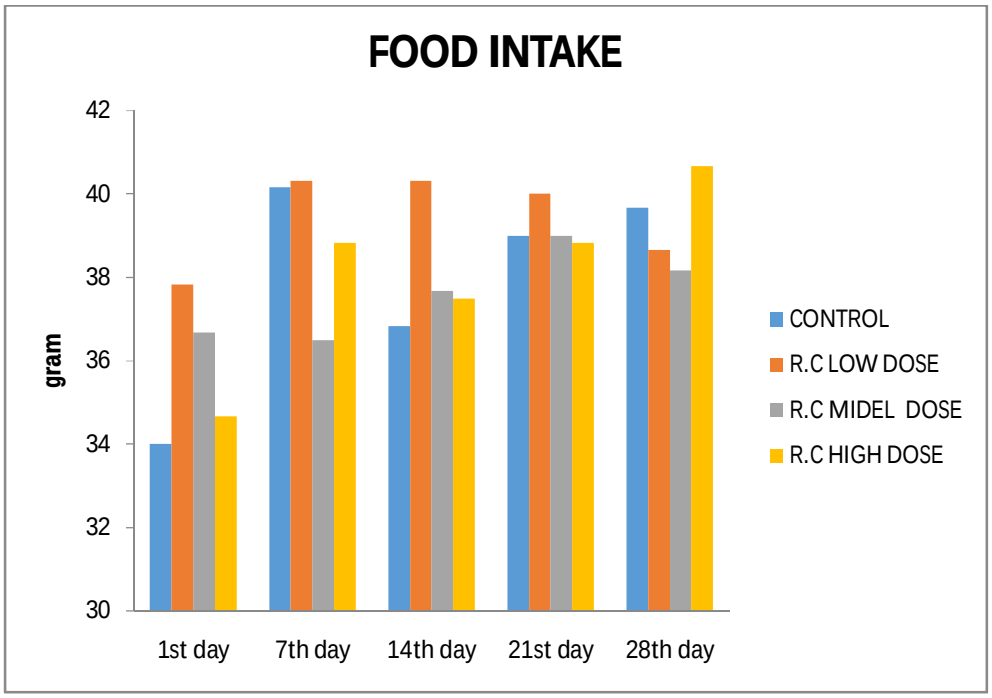




Effect Of Sub- Acute Dose(28 Days)Of *RAJAKESARI CHOORANAM*on Food Intake in gram.

Table No : 24 Effect Of Sub- Acute Dose(28 Days)Of *RAJAKESARI CHOORANAM*on Food Intake in gram

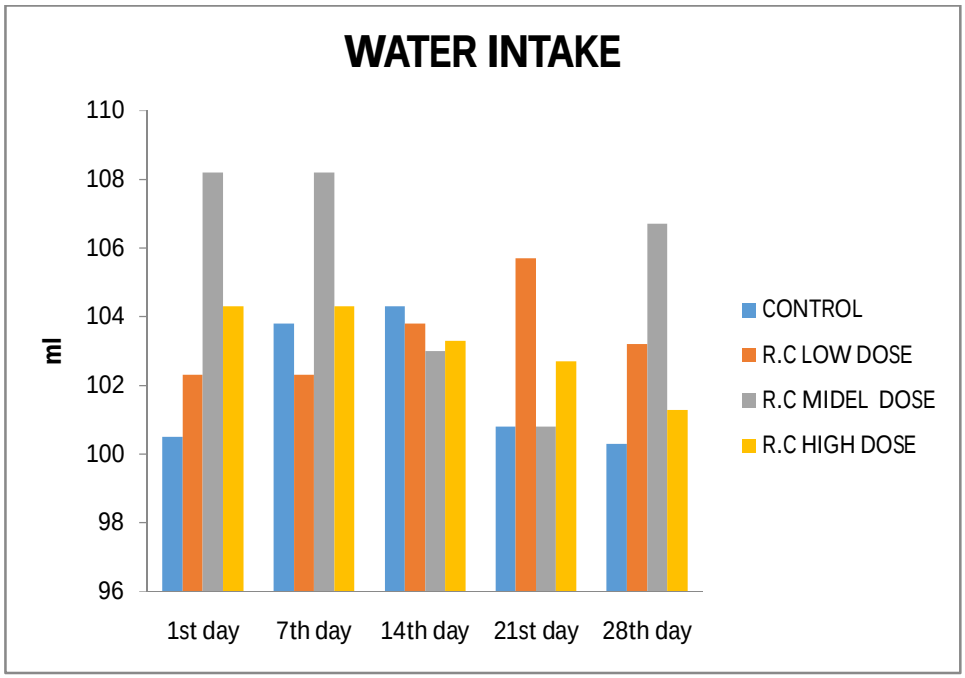
Values arae expressed as mean ± SEM Statisticalsignificance (p) calculated by one way ANOVA followed by dunnett's(n=6); $^{ns}p>0.05$, *p<0.05, **p<0.01, ***p<0.001, calculated by comparing treated groupswith control group.



Effect Of Sub- Acute Dose(28 Days)Of *RAJAKESARI CHOORANAM*on Food Intake in gram.

Values arae expressed as mean ± SEM Statisticalsignificance (p) calculated by one way ANOVA followed by dunnett's(n=6); $^{ns}p>0.05$, *p<0.05, **p<0.01, ***p<0.001, calculated by comparing treated groupswith control group

Effect Of Sub- Acute Dose(28 Days)Of ***RAJAKESARI CHOORANAM***On Water Intake in ml



RESULTS

CLINICAL SIGNS:

All animals in this study were free of toxic clinical signs throughout the dosing period of 28 days.

Mortality:

All animals in control and in all the treated dose groups survived throughout the dosing period of 28 days.

Body weight:

Results of body weight determination of animals Table-1 from control and different dose groups exhibited comparable body weight gain throughout the dosing period of 28 days.

Food consumption:

During dosing and the post-dosing recovery period, the quantity of food consumed by animals from different dose groups was found to be comparable with that by control animals.

Organ Weight:

Group Mean Relative Organ Weights (%of body weight) are recorded in Table No.4 Comparison of organ weights of treated animals with respective control animals on day 29 was found to be comparable similarly.

Hematological investigations:

The results of hematological investigations (Table 4) conducted on day 29 revealed following significant changes in the values of different parameters investigated when compared with those of respective controls; however, the increase or decrease in the values obtained was within normal biological and laboratory limits or the effect was not dose dependent.

Biochemical Investigations:

Results of Biochemical investigations conducted on days 29 and recorded in Table 2 revealed the following significant changes in the values of hepatic serum enzymes studied. When compared with those of respective control. However, the increase or decrease in the values obtained was within normal biological and laboratory limits.

DISCUSSION:

1) All the animals from control and all the treated dose groups up to 900 mg/kg survived throughout the dosing period of 28 days.

2) No signs of toxicity were observed in animals from different dose groups during the dosing period of 28 days.

3) Animals from all the treated dose groups exhibited comparable body weight gain with that of controls throughout the dosing period of 28 days.

4) Food consumption of control and treated animals was found to be comparable throughout the dosing period of 28 days

5) Haematological analysis conducted at the end of the dosing period on day 29, revealed no abnormalities attributable to the treatment.

6) Biochemical analysis conducted at the end of the dosing period on day 29 no abnormalities attributable to the treatment.

7) Organ weight data of animals sacrificed at the end of the dosing period was found to be comparable with that of respective controls.

INTERPRETATION

The Rajakesari Chooranam can be considered safe, as it did not cause any rethality or adverse changes with general behavior of rats and also there was no observable detrimental effects (300 to 900mg/kg body weight) over a period of 28 days. our results have demonstrated that the Rajakesari Chooranam is relatively safe when administered orally in rates.

PHARMACOLOGICAL RESULTS

BRONCHODILATOR RESULT

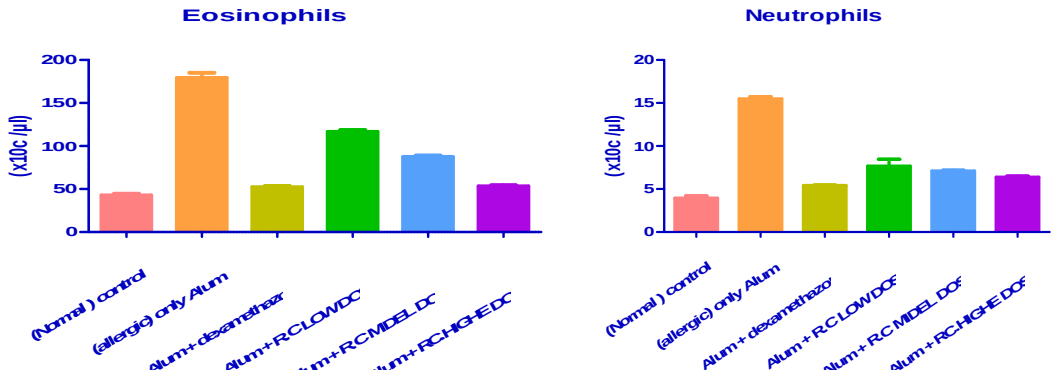
EFFECT OF *RAJAKESARI CHOORANAM* ON BRONCHO-ALVEOLAR LEVAGE IN MICE

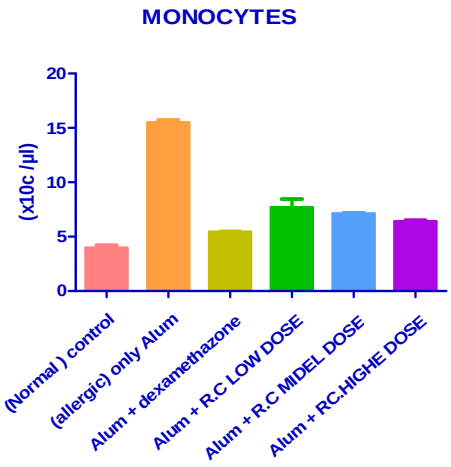
GPS	Eosinophils	Differential Leukocytes ($x10^c/\mu l$)		Total Leukocytes (per cu.mm)
		Neutrophils	Monocytes	

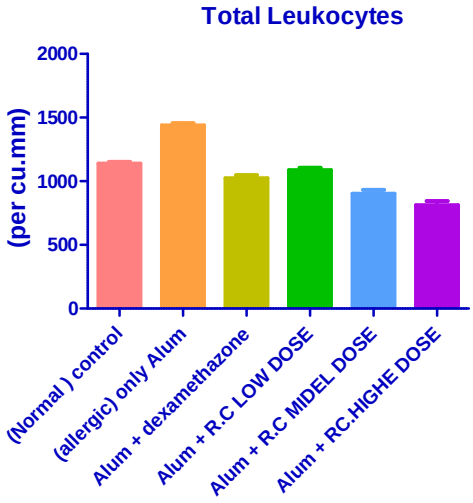
(Normal) control	42.6667± 1.83787	3.93333± 0.276486	42± 1.46059	1138.67±1 3.2531
(allergic) only Alum	179.333± 5.67255***	15.4667± 0.256472***	61.3333± 2.56472***	1438.67± 17.7739***
Alum + dexamethazone	52.3333± 1.28236*	5.4± 0.0730297*	36.6667± 1.83787*	1024± 24.133**
Alum + R C.LOW DOSE	116.667± 1.83787***	7.66667± 0.787683***	49± 2.39444***	1087.33± 18.2623***
Alum + R C.MIDLE DOSE	87.3333± 1.52023***	7.1± 0.0966092***	37± 1.09545***	903.333± 29.2878***
Alum + R C.HIGH DOSE	53.3333± 1.11555***	6.36667± 0.147573***	30.3333± 0.557773***	813.333± 30.4047***

Table No. 25 Effect Of *Rajakesari Chooranam* On Broncho-Alveolar Levage In Mice

Values are expressed as the mean ± S.D; Statistical significance (p) calculated by one way ANOVA followed by dunnett's ns- no significant *P< 0.001, **P < 0.01, ***P < 0.05 calculate by comparing treated group with CONTROL group.







RESULTS

Increased level ofLeucocytes and eosinophils counts in our respiratory system play a vital role to induce bronchial hypersensitivity and produces airway inflammation in allergic and non-allergic asthma. The inflammatory reaction of bronchial walls in asthma is brought about increased level of bronchial eosinophils. It occupied in the later phase reaction of bronchial asthma.

Subcutaneous administration of boiled and cooled milk into the Wister albino rats acts as antigen and produced allergic response in mice increase the total leucocyte and eoisinophil count in 24 hour administration (Limbasiya KK. et al, 2012). During asthmatic inflammation leukocytes release the following inflammatory mediators are cytokines, histamine mainly and basic protein, which promote the endurance of inflammation [Brekhman LI et al., 1969]. Eosinophils infiltrating the airway also have an effect on mucus secretion by epithelial goblet cells (Shimizu T et al., 2003). Eosinophils part in bronchial asthma was quite an active in the development of allergic airway inflammation (Elizabeth R. Walsh et al., 2010). Eosinophil creates bronchoconstriction through the secretion of mediators such as eosinophil cationic protein, eosinophil-derived neurotoxin, and prostaglandin, which results in broncho constriction in respiratory tract (Limbasiya KK. et al, 2012).

In this study was observed that leukocytes count was decreased in rat treated with *RAJAKESARI CHOORANAM* at doses of 200mg/ kg significantly as compared to disease control group. Result suggests that *RAJAKESARI CHOORANAM* decreases milk induced leukocytes count in rat. And this study was observed that *RAJAKESARI CHOORANAM* at doses of 200mg/kg significantly decreased milk induced eosinophils count in rat. Eosinophils counts of disease control group was compared with *RAJAKESARI CHOORANAM* treated group results showed the drug reduces eosinophil counts in rat. Finally the test drug *RAJAKESARICHOORANAM* treated group rat leucocytes and eosinophils count was considerably reduced. During bronchial asthma broncho construction is developed by inflammatory changes of the airways.

If a drug reduces or prevents bronchial inflammation of airways bronchodilation happens. The effect of *RAJAKESARICHOORANAM* on reducing bronchial inflammation through reducing the increased leucocytes and eosinophils counts in rat. Finally the *RAJAKESARICHOORANAM* results represents reduce bronchial inflammation helps airways to dilate. *RAJAKESARI CHOORANAM* indirectly proves its broncho dilator activity in the management of asthma.

Interpretation

The test drug Rajakesari Chooranam has got significant Broncodilator Activity.

ANTI SPASMODIC ACTIVITY RESULT

DoseResponse Relationship Observations of Acetylcholine

Si.No	Concentration/dose	Acetylcholine
		Response (cm)
1	0.1 ml	1.8cm
2	0.2 ml	2.6cm
3	0.4 ml	2.9cm

4	0.8 ml	3.3cm
5	1.6 ml	3.7cm

Table No. 26 Dose Response Relationship Observations of Acetylcholine

DoseResponse Relationship Observations of Atropine

Si.No	Concentration/dose	atropine
		Response (cm)
1	0.1 ml	-
2	0.2 ml	-
3	0.4 ml	-
4	0.8 ml	-
5	1.6 ml	-

Table No. 27DoseResponse Relationship Observations of Atropine

Dose Response Relationship Observations of Acetylcholine and **RAJAKESARICHOORANAM**

Si.No	*Concentration/dose*	*Acetylcholine + Rajakesarichooranam*
		Response (cm)
1	*0.1 ml +0.1 ml*	*3.3 cm*
2	*0.2 ml +0.2 ml*	*3.9 cm*
3	*0.4 ml +0.4 ml*	*4.1 cm*
4	*0.8 ml +0.8 ml*	*4.6cm*
5	*1.6 ml + 1.6 ml*	*5.1cm*

Table NO. 28 Dose Response Relationship Observations of Acetylcholine and **RAJAKESARICHOORANAM**

Comparative Dose Response of Ach and Ach followed by Rajakesarichooranam

Si No	Treatment	Dose(ml)	response	% of response
1	Acetylcholine	0.1 ml	1.8 cm	
2		0.2 ml	2.6 cm	
3		0.4 ml	2.9 cm	
4		0.8 ml	3.3 cm	
5		1.6 ml	3.7 cm	

6	Acetylcholine + Rajakesarichooranam	0.1 ml +0.1 ml	3.3 cm	12.5 %
7		0.2 ml +0.2 ml	3.9 cm	15.78 %
8		0.4 ml +0.4 ml	4.1 cm	24.48 %
9		0.8 ml +0.8 ml	4.6 cm	23.63 %
10		1.6 ml + 1.6 ml	5.1 cm	16.94 %

Table No. 29 Comparative Dose Response of Ach and Ach followed by Rajakesarichooranam

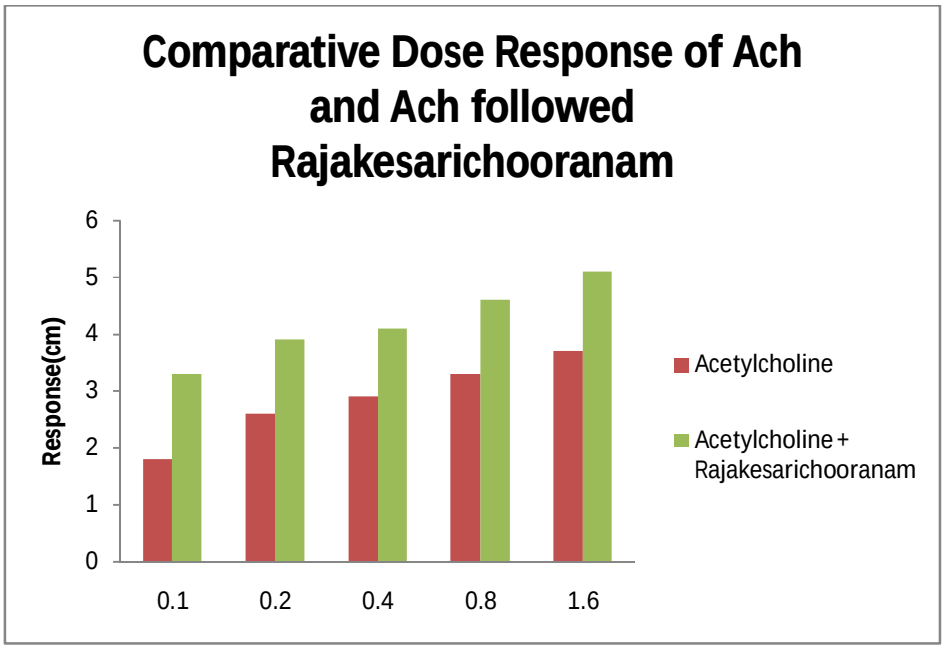


Fig: Comparative dose response relationship of Acetylcholine and Rajakesarichooranam.

RESULTS

Effect of Acetylcholine on excised rat ileum reflected an increase in spasmodic activity (response) with an increase in dose

DISCUSSION:

From the present study results it was observed that acetylcholine (Ach) alone cause's contraction of excised rat ileum but when acetylcholine was given in presence of ***Rajakesarichooranam*** there was a marked decrease in contraction of ileum was observed.

This revealed that ***Rajakesarichoorana***m possess a high degree of spasmolytic (anti-spasmodic) activity by blocking cholinergic receptors.

INTERPRETATION

The test drug Rajakesari Chooranam has got significant Anti-Spasmodic Activity.

ANTI HISTAMINE ACTIVITY RESULT

EFFECT OF RAJAKESARI CHOORANAM ON MAST CELL STABILIZATION IN SENSITIZED RATS

GROUPS	MAST CELLS	
	INTACT	DISRUPTED
NORMAL CONTROL	82.50±3.85	15.90±0.82

SENSITIZED RATS	12.60±0.95	88.30±2.45
rajakesari chooranam 200mg/kg	65.80±2.65*a	36.52±1.32*a
Rajakesari chooranam 400**mg/kg**	63.50±2.45*a	34.40±1.30*a

TABLE NO:30 EFFECT OF RAJAKESARI CHOORANAM ON MAST CELL STABILIZATION IN SENSITIZED RATS

- Values are expressed as Mean±S.E.M

*a significantly different from sensitized control at p<0.01

Effect of rajakesari chooranam on histamine induced bronchospasm in guinea pigs.

GROUPS	**PRE-CONVULSION DYSPNEA (PCD)(SEC)**		
	DAY 0	**DAY 1**	**DAY 5**
GP 1	178.22±7.24	265±9.5	212.25±9.2
GP 2 (rajakesari chooranam 200mg/kg)	180.25±6.55	220±6.0	412±14.8*a
GP3 (rajakesari chooranam 400mg/kg	182.30±6.70	222±8.5	405±13.6*a

TABLE NO 31 : Effect of rajakesari chooranam on histamine induced bronchospasm in guinea pigs.

Values are expressed as Mean ±S.E.M

*a Significantly different from control on day 5 at p<0.001

RESULTS

Statistical analysis

The results of various studies were expressed as mean ± SEM and analyzed statistically using one-way ANOVA, followed by Newmann keul's multiple range tests. P<0.05 was considered statistically significant.The analysis was performed using Graphpad Prism software package (Version 4.0).

Mast cell stabilizing potential of rajakesari chooranam Antigen challenge resulted in significant degranulation of the mesentric mast cells. Pretreatment of sensitized animals with rajakesari chooranam at a dose of 200mg/kg and 400mg/kg, p.o., for 2 weeks resulted in a significant reduction in the number of disrupted mast cells (P <0.001) when challenged with horse serum.

Effect on histamine-induced bronchospasm

Rajakesari chooranam at a dose of 200mg/kg and 400mg/kg p.o., significantly prolonged the latent period of PCD ($P < 0.001$) as compared to control, following exposure to histamine aerosols on day 5 [Table no. 2].

Discussion

Experimental animal model of asthma is characterized by allergen-induced immediate airway constriction and late airway reactivity to a pharmacological vasoconstrictor such as histamine and leukotrienes. Histamine is a central mediator in the pathogenesis of allergic and inflammatory disorders. In the present study, rajakesari chooranam prolonged the latent period of PCD in guinea pigs following histamine aerosol. This may be suggestive of an antihistaminic activity following treatment with rajakesari chooranam.

Antigen challenge, in sensitized animals, results in the degranulation of mast cells, which is an important feature of anaphylaxis. In the present study, rajakesari chooranam showed marked protection against the mast cell degranulation following antigen challenge in sensitized animals. Mast cell stabilizing activity of rajakesari chooranam may be attributed to the presence of active constituents which are known for their mast cell stabilizing potential against antigen–antibody reaction and/or due to the suppression of IgE antibody production, which is responsible for degranulation mast cells.[8]

This antianaphylactic and antihistaminic effect may be caused by the stabilization of the mast cell membrane, suppression of IgE, and inhibition of pathological effects induced by the release of inflammatory mediators in rajakesari chooranam treated animals. All the above findings lend credence to the beneficial use of rajakesari chooranam in the treatment of asthma and related conditions.

However, further studies with other experimental models, especially to explore the role of cytokines are warranted to substantiate the antiasthmatic and antiallergic activity of rajakesari chooranam.

INTERPRETATION:

The test drug Rajakesari chooranam has got significant Anti-histaminic activity.

ANTI-INFLAMMATORY ACTIVITY OF SIDDHA FORMULATION

Treatment	**Dose (mg/kg)**	**Paw volume(ml) as measured by mercury displacement at 6 hour**	**Percentage inhibition of paw edema**

Group I Normal saline	10ml/kg orally	5.22±0.75	-
Group II Std	10mg/kg I.P.Diclofenac sodium	1.68±0.52	67.34%*a
Group III siddha preparation rajakesari chooranam	200mg/kg.Orally.	2.08±0.48	60.52%*a
Group IV siddha preparation rajakesari chooranam	400mg/kg.Orally.	1.98±0.45	63.73%*a

TABLE No.32

* Data are expressed as Mean ± S.E.M.

*Data were analyzed by one way ANOVA followed by Newman's keul's multiple range tests, to determine the significance of the difference between the control group and rats treatedwith the test compounds.

*a Values were significantly different from normal control at P< 0.01.

Both doses of siddha preparation rajakesari chooranam at 200mg/kg and 400mg/kg were tested for their Anti- inflammatory activity by using carrageenan Induced rat paw edema method and the results are tabulated in table no 1. The results reveals that both doses of siddha preparation rajakesari chooranam at 200mg/kg and 400mg/kg doses possesses significant Anti- inflammatory activity when compared to control group at p<0.01.

INTERPRETATION:

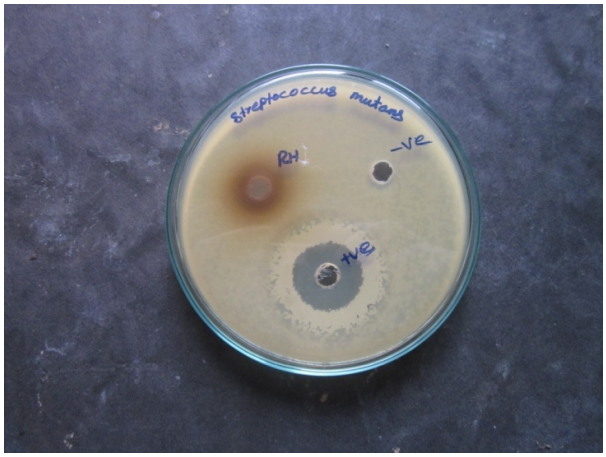
The test drug Rajakesari chooranam has got significant Anti-Inflammatory activity.

ANTI MICROBIAL ACTIDITY RESULTS

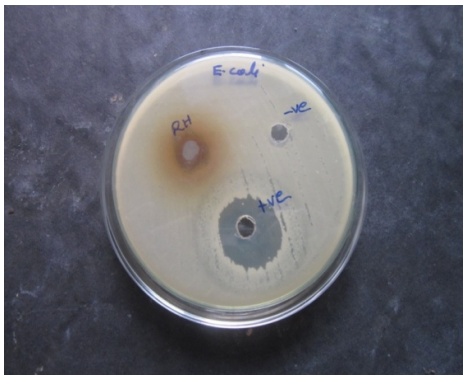
Table No: 15-:

s.no	Organism	Susceptibility	Zone inhibition

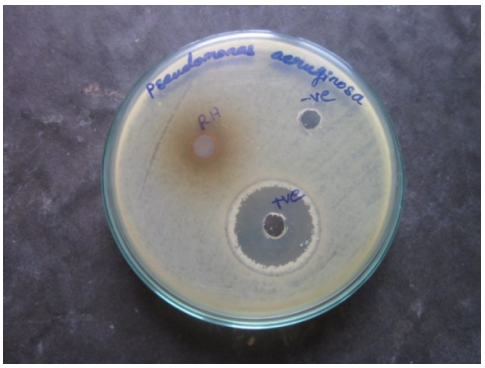
	(Culture)		Streptomycin zone size	Medicine size
1.	E.coli	Sensitive	22mm	13mm
2.	Klebsiella pnemoniae	Sensitive	29mm	18mm
3.	Staphylococcus aureus	Sensitive	24mm	12mm
4.	Streptococcus mutant	Sensitive	22mm	15mm
5.	Enterococcus faecalis	Moderate Sensitive	32mm	22mm
6.	Pseudomonas aeruginosa	Resistant	24mm	18mm



KLEBSIELLA



E.COLI



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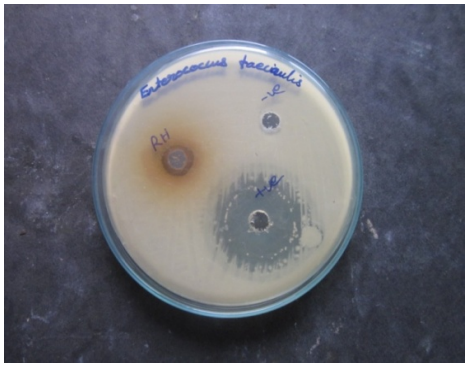
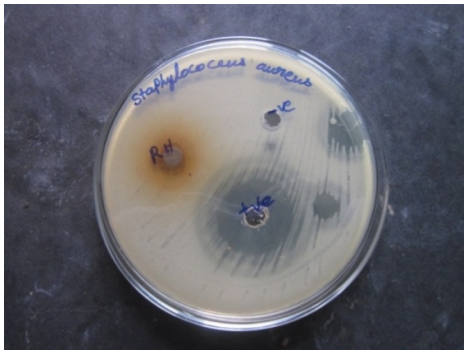


ENTEROCOCCUS



STAPHYLOCOCCUS

INTERPRETATION

It was observed that antimicrobial studies of *Rajakesari chooranam* showed that it is sensitive agent E.Coli, Klebsiella.When compared to the standard drug (streptomycin) Which was evident from the zone Inhibition .The herbal drug *Rajakesari chooranam* showed the inhibiton of the growth of the micro organisam at 100 microgram/ml concentration for the organism.Our results confirmed the traditional use of *Rajakesari chooranam* has anti microbial activity.

6. SUMMARY

The test drug **RAJAKESARI CHOORANAM** is selected from the text, ***ANUBOGA VAITHIYA BRAMMA RAGASIYAM*** (Page no.100) for the evaluation of safety, efficacy and therapeutic potency on Bronchial asthma for its Broncho dilator, anti spasmodic, anti histamine, and anti inflammatory activities.

A review of the literatures and lateral research works about Piper cubeba,Myristica fragrans, Alpinia galanga, Piper longum,Moschus moschiferus, Cinnamomum verum, Syzygium aromaticum, Zingiber officinale, Quercus infectoria, Elettaria cardamomum, Glycyrrhiza glabra, they are having anti-inflammatory, antispasmodic, anti-asthmatic, antihistaminic activity.

Physico-chemical analysis shows, it was within acceptable range.So it can be stored for a long period and would not easily be attacked by microbes.

Total ash value of plant material indicated the amount of minerals and earthy materials present in the plant material. The total inorganic content (ammonium, potassium, calcium, chloride, iron, etc.,) present in the drug is measured through the Total ash value and it is of 5.8 % for *RC.*

The acid insoluble ash value of the drug denotes the amount of siliceous matter present in the plant. The quality of the drug is better if the acid insoluble value is low. It is 0.8% for *RC.*

Water-soluble ash is the part of the total ash content, which is soluble in water. It is 18.4% for *RC*

Alcohol-soluble ash is the part of the total ash content, which is soluble in alcohol. It is 22.1% for *RC*

- ❖ These are indicating the approximate measure of chemical constituents of crude drug.
- ❖ The percentage of soluble matters present in the drug is determined by the values of water extractive and ethanol extractive.
- ❖ Based on the extractive value suitable solvent can be selected. It also gives the percentage of drug which will correlate with the metabolism reactions.
- ❖ Water-soluble extractive value plays an important role in evaluation of crude drugs
- ❖ The alcohol-soluble extractive value was also indicative for the same purpose as the water-soluble extractive valueLoss on drying :

- ❖ The total of volatile content and moisture present in the drug was established in loss on drying.
- ❖ Moisture content of the drug reveals the stability and its shelf-life.
- ❖ High moisture content can adversely affect the active ingredient of the drug.

Thus low moisture content could get maximum stability and better shelf life

Water soluble extract shows,water is a better solvent of extraction for the formulation.Disintegration time shows, quickly disintegrate with water.TLC result shows variation of R_f values indicated the presence of alkaloids,phenols,tannin,and some unknown compounds in this drug.

Biochemical analysis shows the presence of Sulphate, Starch, Ferrous iron, Tannic acid, unsaturated compounds, and aminoacids.

Iron is an essential constituent of Hemoglobin, cytochromes and other components of respiratory enzyme systems like cytochrome oxidase, catalase, and peroxidase. It enhances the arterial oxygen level. The drug enhances oxygen supply and promotes the normal ventilation of the lungs and reduces the dyspnoea. It participate the cellular oxidation mechanism.

Amino acids act as neurotransmitters and some act as starting materials for the biosynthesis of neurotransmitters, hormones and other important biochemical compounds.Amino acids contribute to various anti-oxidant and immunological activities relevant to asthma pathogenesis, raising the possibility that differences in amino acids may be involved in asthma aetiology.

Sulphate has been considered as an adjunct therapy for severe and lifethreatening asthma exacerbation.

Tannins

Helps in healing of wounds and inflammation of mucous membrane.

They restore the Anti-Oxidant status of the organs to almost normal levels.

Increases the cellular Anti-Oxidant enzymes

ICP-OES results shows below detection limit (BDL) of Arsenic, Mercury, Cadmium, Lead, Aluminum, and Copper.It is evident that the effectiveness of siddha medicine has been proved by the modern scientific way.

- Presence of Mg&So_4, has been considered as an adjunt therapy for severe and life threatening asthma exacerbation. Theoritically, Magnesium can induce bronchial

smooth muscle relaxation in dose dependent manner. Sodium regulates the body's acid base balance. Iron is essential for may numbers of biological functions such as growth, reproduction, healing and immune function. The phosphorus is involved in tissue repair and silicon reduce digestive disorders. Sulphate is potent anti oxidant activity in human body. Zinc has got potent anti-microbial activity.

FTIR results shows It cofirms that Rajakesarii chooranam contains Alkanes, Amines, Aromatics, Aliphatic, Nitriles, Primary, Secondary, Amides, and Saturated aliphatic, Ester, Alkyl halides, Alkenes.

TLC results shows under UV 254 nm and 366 nm test related to alkaloids, it shows major spots short at Rf 0.90 (Green), 0.89, 0.80,0.71,0.64,0.57 (Violet), and long at Rf 0.90(Green),0.89,0.80,0.71,0.64,0.57(blue). TLC of *RC* various Rf values was observed. The variation of Rf values indicated the presence of alkaloids, phenols, tannin and some unknown compounds in this drug.

SEM analysis result shows most of the particles present in the sample is,average particle size -5 microns.So very minimal quantity of the medicine is enough to treat the disease.Target cells takes up these micro particles enhance the bioabsorbtion and bioavailability resulting efficacy of the drug will be increased.

Acute And Sub-Acute Toxicity were carried out in wister albino rats according to OECD guidelines(423). This drug has no acute toxicity as there was no mortality seen sub-acute toxicity is carried by repeated dose of test drug for 28 days. Mortality, the functional observations, haematological and bio-chemical investigations were done. So the toxicological study of these test drug, *Rajakesari Chooranam* establish the safety of the drug for long time administration.

Pharmacological analysis shows that the drug has got significant antispasmodic activity and excellent anti-histaminic activity and good anti inflammatory activity and significant bronchodilator activity. Hence it can be concluded that this drug may inhibit the tone of tracheal and bronchial muscles and thus has a good (Bronchodilator) anti-asthmatic action.

Antimicrobial studies show, antimicrobial activity against the E.coli, Pseudomonas Aeruginesae, Klebisella pneumonia, Streptococcus mutant, Staphylococcus aureus, Enterococcus faecalis which compared to standard drug (streptomycin).This is mainly due to the phytochemical constituents present in the drug.

In Siddha concept if *Thee poodha* controls deranged *kabha poodha* which is the one of the causative factor of the **Bronchial Asthma (Eraippu Noi),** thus it relieves “Eraippu Noi”.

7. CONCLUSION

RAJAKESARI CHOORANAM was selected for the elaborate study of its efficacy on *Eraippu Noi* (Bronchial Asthma).

From the literature review, Physico-chemical, Pharmacological, Microbiological, Biochemical, Instrumental analysis, It has been concluded that *RC* has got a good Bronchodilator, Anti-spasmodic, Anti-histaminic, Antiinflammatory activity and hence effective for *EraippuNoi*.

8. FUTURE SCOPE

The trial drug *Rajakesari chooranam* has its own potency in treating Bronchial Asthma in animal model which has been established in this study.However, the mechanism of action by which *Rajakesari chooranam* produced its effect on the Bronchial Asthma in experimental animal models and also multicentre clinical trials are required to understand the exact molecular mechanisms of action.So it could be used worldwide in treatment of Bronchial Asthma.

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GOVT. SIDDHA MEDICAL COLLEGE

PALAYAMKOTTAI

SCREENING COMMITTEE

Candidate Reg. No: 32121.2006

Department: GUNAPADAM

This is to certify that the dissertation topic Rajakesari Chooranam for its Bronchodilator, Anti-spasmodic, Anti-histamine & Anti-inflammatory activities has been approved by the screening committee.

Branch	Department	Name	Signature
1	Pothu Maruthuvam	Dr.S.Aathi Narayanan MD(S).,	
2	Gunapadam	Dr.M.Ravi Chandran MD(S).	
3	Sirappu Maruthuvam	Dr.S.Kaniraja MD(S).,	
4	Kuzhanthai Maruthuvam	Dr.D.K.Soundararajan MD(S).,	
5	Noi Nadal	Dr.S.K.Sasi MD(S).,	
6	Naju Nool Maruthuvam	Dr.M.Thiruthani MD(S).,	

Remarks:

INSTITUTIONAL ETHICAL COMMITTEE,

GOVERNMENT SIDDHA MEDICAL COLLEGE, PALAYAMKOTTAI,

TIRUNELVELI - 627002,

TAMIL NADU, INDIA.

Ph: 0462-2572736/2572737/2582010 Fax: 0462-2582010

F.No.GSMC/5676/P&D/Res/IEC/2014 Date: 16.07.2015

CERTIFICATE OF APPROVAL

Address of Ethical Committee	Government Siddha Medical College, Palayamkottai, Tirunelveli, Tamil Nadu, India. Pincode: 627002.
Principal Investigator	Dr.P.Nithiya MD(s)- II year, Department of Gunapadam , Reg. No.: 321312006.
Guide	Dr. M.RAVICHANDRAN MD(s), ph.D H.O.D., Department of Gunapadam Govt. Siddha Medical College and Hospital, Palayamkottai, Tirunelveli District.
Dissertation Topic	PRE CLINICAL EVALUATION OF SIDDHA HERBAL FORMULATION **'RAJAKESARI CHOORANAM'** FOR ITS BRONCHODILATOR,ANTI SPASMODIC,ANTI HISTAMINE AND ANTI INFLAMMATORY ACTIVITY.
Documents Filed	1) Protocol
Clinical / Non Clinical Trial Protocol	Non Clinical Trial Protocol
Informed Consent Document	NA
Any other Documents	NA
Date of IEC Approval & its Number	GSMC-II-IEC/2015-Br.-II/06/16.07.2015

We approve the trial to be conducted in its presented form.

The Institutional Ethical Committee expects to be informed about the process report to be submitted to the IEC atleast annually of the study, any changes in the protocol and submission of final report.

16/7/2015 16/7/15

Chairman (Prof. Dr. M. Loganayaki)

Member-Secretary (Prof. Dr. S. Sengottuvelu)

KMCH COLLEGE OF PHARMACY – COIMBATORE

IAEC - CERTIFICATE

This is to certificate that the project title PRECLINICAL STUDY OF HERBAL DRUG RAJAKESARI CHOORANAM FOR ITS BRONCHODILATOR, ANTI SPASMODIC & ANTIHISTAMINE, ANTI-INFLAMMATORY ACTIVITIES
has been approved by the IAEC/ KMCRET/ MD (S) / 17 / 2016-2017.

Name of the Chairman / Member Secretary IAEC:

Signature with Date

PRINCIPAL
KMOH College of Pharmacy,
Kovai Estate, Kalapatti Road,
Coimbatore - 641 048
Tamil Nadu, INDIA

Chairman / Member Secretary of IAEC

Name of the CPCSEA Nominee

CPCSEA Nominee
(V. VINAYAK KULKARNI)

(Kindly make sure that minutes of the meeting duly signed by all the participants are maintained by office).

CERTIFICATE OF BOTANICAL AUTHENTICITY

Certified the following plant drugs used in Siddha formulation ***"Rajakesari Chooranam"*** taken up for Post Graduation Dissertation Studies by **Dr. P. Nithya** PG Dept. of Gunapadam, are correctly identified and authenticated through Visual inspection / Organoleptic Characters / Experience, Education & Training Morphology / Microscopical and Taxonomical methods. The identified raw drugs is preserved to air tight container for further reference.

Drug : RAJA KESARI CHOORANAM

INGREDIENTS:

S.No.	Name	Botanical Name
1.	Athimathuram	Glycyrriza glabra
2.	Yelam	Elettaria cardomum
3.	Chukku	Zingiber officinale
4.	Jaathikkai	Myristica fragrans
5.	Lavangapattai	Cinnamomum verum
6.	Kirambu	Syzygium aromaticum
7.	Thippili	Piper longum
8.	Maasikkai	Quercus infectoria
9.	Perarathai	Alpinia galanga
10.	Valmilagu	Piper cubeba

Station : Palayamkottai

Date : 08.07.15

08.07.15

Dr.S. SULFIN NIHAR, M.D(s).,

Assistant Lecturer,
Department of Gunapadam
Govt. Siddha Medical College,
Palayamkottai.

AUTHENTICATION CERTIFICATE

Date: 08.07.2015

Certified that the following Zoological drug submitted for identification by Dr. P. Nithya, PG Department of Gunapadam, Govt.Siddha Medical College, Palayamkottai are identified as

1. Kasthuri (Moschiferus musk)

Dr.A.KINGSLY,M.D(S).,
Lecturer,
Department of PG Gunapadam
Govt.Siddha medical college,
Palayamkottai.

The Tamil Nadu Dr.M.G.R. Medical University

#69, Anna salai, Guindy, Chennai-600 032.

This certificate is awarded to

Dr./~~Mr.~~/~~Ms.~~ P. NITHIYA

for participating as ~~Resource Person~~ / Delegate ✓ in the Fifteenth Workshop on

"Research Methodology & Biostatistics"

for AYUSH Post Graduates & Researchers

Organised by the Department of Siddha

The Tamil Nadu Dr. M.G.R. Medical University from 23.06.2014 to 27.06.2014.

Dr. N. KABILAN M.D. (Siddha) Reader, Dept. of Siddha	**Dr. JHANSI CHARLES,** M.D. Registrar	**Prof. Dr. D. SHANTHARAM,** M.D., D.Diab., Vice-Chancellor

S.A.RAJA PHARMACY COLLEGE

Vadakangulam, Tirunelveli District-627 116, Tamil Nadu.

23rd January 2016

CERTIFICATE

Certified that Prof ./Dr./Mr./Ms./Mrs.....P. NITHIYA.....

*Participated in the National Level Seminar on **"Analytical and Bio - Analytical Techniques in Plant Research"** as a Delegate and Presented a Poster Entitled.....*

organised by S.A. Raja Pharmacy College and sponsored by Association of Pharmaceutical Teachers of India, Tamil Nadu Branch.

Dr.S.A. Jacob Raja	**Dr.N.Balakrishnan**	**Dr.R.Xavier Arulappa**	**Dr.K. L.Senthil Kumar**
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National Conference on

EMERGING TRENDS IN MEDICINAL PLANTS AND HERBAL PRODUCTS

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Certificate

This is to certify that Mr/ Ms/ Dr. P. Nithiya

of Government Siddha Medical College, Palayamkottai

has actively participated/ presented a paper/ poster in the National Conference on **EMERGING TREND**

IN MEDICINAL PLANTS AND HERBAL PRODUCTS held on 12th and 13th December, 2013 organized b

the Research Department of Botany, VHNSN College (Autonomous), Virudhunagar, Tamilnadu.

Organizing Secretary | Head of the Department | Principal